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AUTHOR	Holmberg, Borje
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ABSTRACT

This two-volume report summarizes and comments on international research into distance education done after 1970 and on some older research deemed still to be important. In the first volume, the review of research and development work is organized into 15 topic areas: (1) general analyses of distance education, philosophy and theory; (2) studies of student groups and students' motivation; (3) course planning and study objectives; (4) course development; (5) media; (6) non-contiguous tutorial two-way communication; (7) face-to-face sessions; (8) counselling; (9) institutional planning, organization and administration; (10) economics of distance education; (11) evaluation; (12) history of distance education; (13) distance education in developing countries; (14) guidelines for distance educators; and (15) research on research. An appendix provides summaries of research projects too special or too technical to have been included in the main presentation, and 22 references are listed. The second volume is a supplement which covers 10 of the same research areas (omitting those numbered 1, 10, 11, 12, and 14 above) and includes 12 pages of additional references. (LMM)

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Recent Research into Distance Education

Börje Holmberg

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RECENT RESEARCH INTO DISTANCE EDUCATION

As a result of an initiative of the ICCE Research and Publications Committee an attempt has been made to bring together what is known about important research made in the field of distance education during the latter half of the 1970s. The following is a report about the findings. To some extent it can be regarded as a follow-up study to Granholm & Ljoså 1977.

It has proved unrealistic strictly to limit this survey to activities begun in and after 1975 or even 1970 as in many cases the research work done during the last few years is immediately dependent on and related to previous work. Nevertheless research prior to 1970 is referred to only in exceptional cases.

Research is taken to mean 'Research and Development Work'. The report includes a survey of relevant R & D work, an appendix describing some special research projects and a bibliography.

The report is based on the following work done by members of the ICCE Research and Publications Committee:

1 an exchange of views by correspondence between the committee members on how to investigate and report on recent research

2 monitoring by the present author, who is chairman of the committee, of publications in English, German, French and the Scandinavian languages

3 a questionnaire survey; a questionnaire was sent to all ICCE members in December 1980 with a request for a reply before 15 March 1981.
58 questionnaire forms had been returned with or withour enclosures by the end of July 1981, when the analysis of the replies began;
a disappointing experience was that no replies had come from some of the member institutions with the biggest research institutes

4 a critical study of my draft report on 2 and 3 by Dr. J. A. Bååth with additions and suggestions for changes.

Computer searches made, for instance at the University of Lund in Sweden and at the Warrnambool Institute of Advanced Education in Victoria, Australia, have contributed comparatively little to what was known in advance. This is to some extent due to a well-known dilemma: a narrow search profile results in few references whereas a wide search profile leads to lists of much fairly irrelevant literature.

The questionnaire procedure applied has unavoidably resulted in fuller reports on those research activities which were reported on to the Research Committee than on research discussed merely on the basis of the present author's previous knowledge and general reading.

The ICCE Research and Publications Committee as well as the author of this report in his capacity both of an individual scholar and a director of a research institute hope that the present survey, although to some extent unavoidably characterised by an idiosyncratic selection and undoubtedly marred by unfortunate gaps for reasons evident from the above, will be welcomed by colleagues in various parts of the world and serve the same useful purposes as Gayle B. Childs' research reports to the ICCE conferences before 1970 (Childs 1965 and 1969) and his overviews (1966 and 1971), which are still highly relevant to distance educators.

Finally a note on a semantic issue. The author applies British rather than for instance American usage. Thus the word tuition as used in this report has nothing whatsoever to do with money. It means tutoring, teaching.

Börje Holmberg

CONTENTS

PAGE

1 A SURVEY OF R & D WORK

1.1 General analyses of distance education, philosophy and theory 3

1.2 Studies of student bodies and students' motivation 11

1.3 Course planning and study objectives 17

1.4 Course development 19

1.5 Media 30

1.6 Non-contiguous tutorial two-way communication 31

1.7 Face-to-face sessions 35

1.8 Counselling 38

1.9 Institutional planning, organisation and administration 39

1.10 Economics of distance education 41

1.11 Evaluation 42

1.12 History of distance education 43

1.13 Distance education in developing countries 44

1.14 Guidelines for distance educators 45

1.15 Research on research 45

2 APPENDIX: Summaries submitted of research projects too special or technical to have been summarised in the above presentation 46

3 Bibliographical references 59

1 A SURVEY OF R & D WORK

1.1 General analyses of distance education, philosophy and theory

During the 1970s 'distance education' seems to have become the most common term to describe the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises, but which, nevertheless, benefit from the planning, guidance and tuition of a tutorial organisation. The term 'distance education' is not universally accepted, however. The terminology was discussed in a paper by Desmond Keegan in the first issue of the Australian periodical 'DISTANCE EDUCATION' published in March 1980. Essentially this paper is concerned with the very character of distance education, however. Many distance educators, whether they use this term or speak of correspondence study, home study, independent study or something more or less synonymous, seem to face an identity problem.

Keegan 1980 a - b stresses as the main elements of distance education

- the separation of teacher and learner which distinguishes it from face-to-face lecturing
- the influence of an educational organisation which distinguishes it from private study
- the use of technical media, usually print, to unite teacher and learner and carry the educational content
- the provision of two-way communication so that the student may benefit from or even initiate dialogue
- the possibility of occasional meetings for both didactic and socialisation purposes
- the participation in an industrialised form of education.

This reference to industrialisation is based on Peters' well-known analysis of distance study as an industrial type of teaching and learning, which includes planning, rationalising procedures, division of labour, mechanising, automation and controlling and checking (Peters 1971 and 1973).

In a paper discussing Keegan's approach Bååth 1981a questions the general relevance of the last two of the six elements listed by Keegan. He points out that

- high-quality distance education can be provided - and sometimes is provided - entirely at a distance, in courses where there is no possibility of additional face-to-face meetings

- although most distance teaching can be characterised as industrialised teaching, there certainly are forms of distance education- e.g. a number of small-scale projects at the university level - that cannot be described this way but rather as teaching of a 'handicraft' type.

Keegan's study seems to be symptomatic of present-day awareness of the necessity to attain some sort of agreement of what can be called the philosophy of distance education. Charles Wedemeyer engages in this discussion in his comprehensive new book "LEARNING AT THE BACK-DOOR" (1981), which analyses the conditions, tasks and procedures of 'non-traditional' learning, and another book published in 1981 (Holmberg 1981a: "STATUS AND TRENDS OF DISTANCE EDUCATION") devotes one chapter to the distance-study concept and another to the philosophy of distance education. These presentations reflect the growing interest in theoretical approaches and attempts at describing a theory of distance education. A scrutiny of the various approaches to a theory of distance education was provided (in German) in Holmberg 1978 a.

There seem to be at least two different schools of thought on distance education, one stressing individual study and individual, non-contiguous tutoring on the basis of course materials produced for large groups of students (cf. Thorpe 1979), the other aiming at parallelism with resident study and usually including class or group teaching face-to-face as a regular element. Whereas the former represents the type of industrialisation leading to rationalisation and economy of quantity discussed by Peters and considers distance education to be basically different from face-to-face education, distance education is to the latter merely a form of distribution for which even the same tutor-student ratio for distance study and on-campus study is considered acceptable and even advantageous (Sheath 1969). The former represents a large-scale approach of the Open University and traditional correspondence school types, the latter a small-scale approach, for which the Australian University of New England can be regarded as a prototype (Smith 1979). In Sweden, which has more than eighty years' favourable experience of the large-scale type of distance education, a successful application of the small-scale type now occurs at the universities (Willén 1981). The Canadian University of Waterloo cassette-teaching system, which addresses classes rather than individuals, is a modified application (Leslie 1979).

Michael Moore 1977a-b has developed a theory of independent study, classifying educational programmes on the two dimensions of autonomy and distance which he describes in the following way:

> Autonomy is the extent to which the learner in an educational programme is able to determine the selection of objectives, resources and evaluation procedures....
> Distance in an educational programme is a function of dialogue and structure. Structure is the extent to which the objectives, implementation procedures and evaluation procedures of the teaching programme can be adapted to meet the specific objectives, implementation plans and evaluation methods of a particular student's learning programme. Dialogue is the extent to which interaction between learners and teacher is possible....
> 'To the extent that a programme consists of pre-produced parts, at least in the form of particularized plans listing item by item the knowledge and skills to be covered by the programme, the programme may not be responsive to learners' idiosyncracies, and structure is said to be high....
> ... when dialogue is difficult, or impossible, and when structure is high, "admonitary acts" become difficult or impossible. In a programmed text, such as Mager's, a minimum of dialogue between teacher and learner is obtained by use of the branching technique. The admonitary acts, such as "oops! You didn't follow instructions", are weak by contrast to the power such statements would carry in a highly dialogic interaction. In telemathic teaching "directive action" is more easily communicated than admonition, but the teacher must assume that a large part of direction, as well as admonition, will be self-administered by the learner. The less distance, the more direction will be feasible. Even the most distant teachers are able to communicate "logical operations". Whether a particular learner will benefit from a programme low in distance, or from a highly telemathic programme is determined by the extent to which he benefits or is impaired by direction and admonition. This is determined by his competence as an autonomous, or "self-directed" learner.
>
> (Moore 1977a; he uses the expression 'telemathic teaching' as synonymous with what is called distance teaching.)

The highest degree of distance occurs when a person studies without any suppoert at all, which Moore describes as 'programmes with no dialogue, and no structure' and exemplifies by 'independent reading-study programmes of the "self-directed" kind' (Moore 1977a, p. 38). A normal distance-study course provides facilities for interaction ('dialogue') as well as structure in Moore's sense. Moore has made an empirical study of the hypothesis that autonomous persons are particularly attracted to distant methods of learning and teaching, which has been, on the whole, confirmed although it has also been found that distant students do not reject guidance (Moore 1976. The Dissertation Abstracts 1976, p. 3344A provide a summary).

Ripley Sims is also concerned with the distinction between distance and conventional study. He points to one clear border line and contributes to the characterisation of distance study (which he calls correspondence study irrespective of media used) by, for instance, elaborating the concept of individualisation:

> ... the basic difference between the contiguous and non-contiguous learning environments is in the means of communication. In the contiguous learning environments, communication is personal and face-to-face; in the non-contiguous environments communication may be personal and face-to-face for limited periods of time, but is largely written, mechanical, electronic or some other means of communicating at a distance (Sims 1977, p. 16).
>
> Correspondence school programmes necessarily emphasize self-instruction as a method of learning. The course materials are prepared to make what is to be learned as clear as possible; to arrange and present the subject progressively in small, relatively easy-to-master steps; to eliminate the repetition of error and to promote the required response; to aid growth in intellectual ability, skill and insight; and to keep the learner conscious of his progress at all times. The self-instruction technique of the correspondence method of study in no way invalidates these basic learning principles. Learning is fundamentally an individual process and each person enters the process with techniques and levels of achievement uniquely his own. The method of correspondence study provides simultaneously an educational device for individualization in three distinct senses - student ability, variety of course offering, and flexibility for time and place of study (Sims 1966 p. 77).

As late as 1971 (in an adaptation of a 1969 paper) G. B. Childs deplored the scarcity of research in the distance education field and said that 'someone would perform a very great service indeed if he would undertake in a very serious and thoughtful way to relate the generally accepted principles of learning to the process of teaching through correspondence study' (Childs 1971 p. 118). This challenge has been taken up by John Bååth who has made a systematic search to illuminate the relation of distance education to various current learning and teaching theories. Thus he has analysed the following models with a view to finding out to what extent they are applicable to distance study:

- Skinner's behaviour-control model
- Rothkopf's model for written instruction
- Ausubel's advance organizer model
- the model of Structural Communication
- Bruner's discovery-learning model
- Rogers' model for facilitation of learning
- Gagné's general teaching model.

For each of them Bååth has investigated its general applicability to distance study, the implications for the development of course material, for non-contiguous two-way communication, and for the supplementing of this two-way communication by face-to-face contacts. Further, he has analysed some special relations between these various models and distance study.

The following would seem to be an accurate summary of Bååth's study:

- All the models investigated are applicable to distance study.
- Some of them (Skinner, Gagné, Rothkopf, Ausubel, Structural Communication) seem particularly adaptable to distance study in its fairly strictly structured form.
- Bruner's more open model and even Rogers' model can be applied to distance study, though not without special measures,e.g. concerning simultaneous non-contiguous communication (telephone, etc.)
- Demands on distance-study systems which should inspire new developments can be inferred from the models studied.

(Bååth 1979)

Learning styles and the cognitive processes have been thoroughly looked into during the last few years. From the points of view of educational research in general Pask 1976, Marton & Säljö 1976 have contributed valuable findings of interest to distance educators. This also applies to some German scholars (Mandl, Fischer, Ballstaedt, Tergan and Schnotz).

To some extent related with this concept of learning styles is the dichotomy between problem-solving approaches and presentations of intellectual knowledge as ready-made (already discovered and described) systems. Weingartz has, on the basis of a consistent view of learning as understanding and problem-solving, provided an in-depth analysis of some distance-study courses from different parts of the world illustrating these differences, and Lehner has developed a learning theory bearing on this. He describes all learning as problem-solving in the sense that it is composed of making assumptions (i.e. developing hypotheses) and modifying these as the learning progresses - an application of Popper's epistemological principles of 'conjectures and refutations'. This leads Lehner to what (like Wagenschein and others) he terms a 'genetic learning approach'. Starting out from problems instead of from the comprehensive systems that the knowledge amassed through the centuries constitute (for instance, when studying gravitation asking the questions of Aristotle, Galileo as Einstein & Infeld do instead of starting by learning the solutions found) favours genetic learning. Weingartz's theoretical approach is linked with Lehner's and has led her to study current practice in distance education. To judge from her study, much remains to be done to improve problem-solving learning in distance study, where on the whole the 'ready-made systems' presentation dominates, although guidance in far-reaching problem-solving occurs in some courses.

The evident conclusions of the studies referred to are that deep-learning and problem-solving approaches can and should be developed further in distance education. It must, on the other hand, be realised that the 'genetic' method of retracing the paths of scholars and scientists in the search for the solutions of problems inclusive of drawing the wrong conclusions (making the wrong hypotheses or conjectures) and later rejecting these in favour of new hypotheses is much too time-consuming a procedure to be applied throughout - - although without doubt an extremely educational experience. (Lehner 1978 and 1979, Weingartz 1980 and 1981, Lehner & Weingartz 1981).

A theory of distance education as a method of guided didactic conversation is being studied (Holmberg 1981a pp. 30 - 32, Holmberg & Schuemer 1980). This theory implies that the character of good distance education resembles that of a guided conversation aiming at learning and that the presence of the typical traits of such a conversation facilitates learning. The distance-study course and the non-contiguous communication typical of distance education are seen as the instruments of a conversation-like interaction between the student on the one hand and the tutor and counsellor of the supporting organisation administering the study on the other. These forms of communication replace what is, in traditional teaching, the interaction with a teacher in class and also provide more intense step-by-step interactions as, unlike traditional study, the support is there all the time or, if study-guide courses are used, generally most of the time. There is a constant conversation between authors and students , simulated through the students' interaction with the pre-produced courses and real through the written and/or telephone interaction with their tutors.

The hypotheses of this theory are these:

- The stronger the characteristics of guided didactic conversation, the stronger the students' feelings of personal relationship between them and the supporting organisation.
- The stronger the students' feelings that the supporting organisation is interested in making the study matter personally relevant to them, the greater their personal involvement.
- The stronger the students' feelings of personal relations to the supporting organisation and of being personally involved with the study matter, the stronger the motivation and the more effective the learning.

Empirical studies testing these hypotheses (as one unified theory) are being undertaken on the basis of distance-study courses in two European countries and in two languages. So far, nothing has come to light that would seem to falsify the hypotheses.

The relation of distance education to the principles of educational technology has been looked into by some scholars and practitioners. This discussion is largely concerned with the use of behavioural study objectives on which see below (1.3). The procedures of educational technology have undoubtedly been deduced from the works of behaviourist psychologists using stimulus-response theory (cf. Mager 1962). While these procedures are being applied to a greater and greater extent, dogmatic behaviourism seems to have few supporters among distance educators. It seems important to point out that what is adopted is mainly a technique that has been found useful. In the development of distance study there is often little thought of stimuli immediately followed by in-detail foreseeable responses. On the contrary, the presentation may be based on assumptions of various cognitive processes incompatible with classical behaviourism. Basing the development of study programmes on analyses of objectives and target groups is the core of this technique. That it is valuable as a practical tool would seem to be evident as long as it is realised that not all study objectives are operational and that a universally applicable media taxonomy is out of reach. It is natural to regard demonstrable behaviour not as the total effect of learning but as a sign indicating the probability that the desired learning has, or has not, taken place. On this issue see 1.3 below.

The systems approach, which in distance education is normally related to educational technology, has been studied and applied in a great number of cases. Examples are to be found in Brevkursproduksjon 1975, Erdos 1975, Graff 1977 and 1978, Holmberg 1981a (pp. 34 - 37), Peters 1973 and Østlyngen 1979. Cf. also Stanford 1979 in section 1.4 below. Wedemeyer 1981 (pp. 116 - 131) has contributed a study of the general principles of instructional design, which he equates with the systems approach to course development. Further cf. Davies 1978a.

1.2 Studies of student bodies and students' motivation

The time-honoured endeavours of distance educators to find out who their students are have continued during the last few years. Some studies have been published. There is no evidence to indicate that distance students should be regarded as a homogeneous group. The only common factor is that, with few exceptions, these students are adults and consequently as a rule are gainfully employed and/or housewives. The age group 25 to 35 seems to be the largest one in most systems. (The Australian University of New England reports that the average age of their distant students was, in 1979, 34 years; 73.1 per cent of the students of the Spanish Universidad Nacional de Educación a Distancia are over 26, whereas correspondence students in Brazil taking courses at lower secondary level are usually 15 to 20-year-old male workers (Smith 1979, p. 21; Alumnos de la UNED 1978, p.14; Maroto 1980). Although in some countries (Norway and Sweden are typical examples) distance study is an almost universally recognised study form, with male and female students in all social strata, in other countries (West Germany, for instance) it is mainly seen as a second chance for adults unable previously to acquire a formal education. Distance study evidently contributes to social mobility. It did so in Sweden during the first half of this century and afterwards, and it does so in the UK at present (Gaddén 1973; Landquist 1948, p. 201; McIntosh 1976).

American and British studies indicate that correspondence students to a greater extent than other adult students have examinations and degrees as their aims (Rossi and Johnstone 1965 in a report on 'Social aspects of correspondence education' as quoted by Mathieson 1971; cf. Dohmen 1976, Glatter & Wedell 1971). On the other hand, considerable numbers of them have declared, in different contexts, that they study purely for academic interest.

McIntosh 1976 and Glatter & Wedell 1971 have shed some light on the reasons why students have chosen distance study instead of other types of adult education. The replies to a questionnaire sent to 20,000 students and answered by some 12,000 showed, according to Glatter & Wedell, that more than 70 per cent chose correspondence study because it was felt easier than unsupported self-study to facilitate the planning of the study programme chosen and to assess the progress made. The time factor came next as a reason given for the choice of study. More than 50 per cent answered that they had chosen correspondence study because it makes 'it easier for you to work at your own pace than if you went to classes'. Almost the same percentage regarded going to classes as 'uneconomical of time'. More than a third of the respondents stated that they preferred studying on their own 'to studying in a class with other people'.

McIntosh's study concerns the first year's intake of students to The Open University and provides detailed information about them. Of the reasons given by students for studying with The Open University, it was found that 'those stressing ends predominated over those stressing means (McIntosh 1976, p. 245). The younger students stressed educational qualifications and jobs, whereas reference to the general widening of knowledge increased with age.

> 'The second group of reasons relates to why students chose the OU rather than some other method of study. There are two main sub-categories: one concerned with the convenience and adaptability of the OU learning system, the other deriving from the student's current lack or past lack of educational opportunity. A sizeable group (12 per cent) indicates that they had had no previous opportunity to study - not unexpectedly, frequency of giving this reason increased with age - and a further 6 per cent stated that they had inadequate qualifications or failed to get into or complete other university courses. Convenience of home-based study is particularly important for housewives. Some students, the Forces and technical personnel particularly, have chosen the OU in preference to normal correspondence courses or an external degree. Interestingly, as many as 9 per cent mentioned being attracted by the innovatory character of OU study, and this varied little across occupational, age and sex groups.'
> (McIntosh 1976, pp. 245, 248)

Open University students on the whole seem to be highly goal-oriented. Thus, of the early students of science, about 75 per cent declared that they studied in order to qualify for promotion, whereas 13 per cent studied 'purely for academic interest' (Holmberg 1976, p. 232).

A British study of a sample of National Extension College students was made as a parallel to those of the Open University Survey Research Department. The most significant findings of the survey was that only 14 % of the students study by correspondence because no other course was available locally. Well over half the students chose to study by correspondence simply because they prefer it to other modes of learning. The study shows that most students (60 %) were in the 25 - 44 age group; the men left school earlier than the women and were less well qualified than the women; however, the women outnumbered men by 56 to 44 (Freeman 1976).

In a study of some 4,000 students of European distance-study institutions, most of them correspondence schools not financed by governments, Flinck found, among other things, that

- fifty-five per cent of the students were men
- the majority (68 per cent) were between 21 and 40 years old (19 per cent over 41).
- sixty-five per cent had a secondary education as their basis.
- most students seemed to be studying to attain competence for better jobs or similar qualifications, and/or to be learning-oriented, i.e. seeking knowledge for its own sake, whereas reasons like gaining social recognition, escaping daily routine or personal problems seemed to have little to do with the study motive.

Flinck's study further shows that the three most important reasons why the students examined had chosen correspondence education were

- the freedom offered to pace their study as they wanted to (83 per cent).
- the support provided in planning the study and assessing progress (in relation to completely unaided study) (73 per cent).
- a predilection for individual work: "I like working by myself" (63 per cent)

(Flinck 1979, pp. 7 - 9).

In many respects, distant students in developing countries seem to have the same motives for study and for their choice of study form. Thus, on the basis of a study of 309 distant students in Ghana, Ansere reports that

> 'occupational objectives weighed heaviest on the students' decisions to take further studies. And within the occupational category, career preparation was the most important, followed by career change and career advancement, in that order.'

A second incentive to study was, according to Ansere's investigation, the wish to gain

> 'admission into higher educational institutions... The next cluster of objectives students had for undertaking further studies was the personal one. The students continued learning in order to gain respect from their peers and other members of the society. The least important set of objectives, according to the students' preferences, was the societal one' (i.e. service to others, leadership).
> (Ansere 1978, p. 14)

The two dominant reasons for choosing a distance-type study given by the majority of the students were:

> 'because correspondence study enables me to earn while studying';
> and
> 'because correspondence study enables me to study in my own time and at my own pace'
> (Ansere 1978, p. 15).

Flinck's and Ansere's findings would seem to support the schools of thought stressing individual learning, free pacing and, as an implicit consequence, the large-scale approach, provided, of course, that the students' own verdict is accepted. Cf. Glatter & Wedell 1971, Goorhuis 1977, Rekkedal 1976 and Wångdahl 1979.

The facts available about distant students throw some light on the drop-out problem. As indicated above there usually is a high drop-out rate in distance study (Rekkedal 1972a provides relevant data on drop-out figures in correspondence education) except in the cases when it is supervised along the lines of residential study as in the Australian systems (the drop-out /'withdrawal'/ rate of the successful New England system 'has averaged out at about 20 per cent' -/Smith 1979, p. 27/-), or is part of in-service training or similar study programmes for homogeneous target groups with well-defined study goals (such as promotion).

In other cases, the problem is to decide what constitutes drop-out in the sense of failure. Even drop-out in the sense of non-completion of submission assignments causes difficulty in this respect, as often there is no specified period of time within which a course is to be completed.

Recent studies on the problems of drop-out in distance education have been performed by, for instance, Bååth 1981b, Houtkoop 1981b, Rekkedal 1972a and 1981. On the importance of short turn-round lines for students' assignments see below section 1.6.

A couple of papers by Bowlay on the students of the University of New England in Australia are of considerable interest. One is an empirical study of motivational factors associated with persistence and discontinuation in a first year of external tertiary studies at the University of New England, Armidale, N.S.W (Australia). A group of 280 mature age 'open entry' new external students in 1979 were studied with a view to identifying factors of a motivational nature associated with either persistence or discontination. The study was conducted on a longitudinal or 'before' and 'after' basis, and identified two variables of cognitive rather than dispositional nature, (a) self-confidence, (b) perceived support from significant others, as positively related to persistence. Those with higher self-confidence and more perceived support tended to complete a first year; those with lower measures in those indices tended to discontinue. The two variables identified as associated with persistence were in themselves correlated significantly (Bowlay 1979a).

A second study of Bowlay's is called 'Motivation and external students, pleasure or profit?'. This is a study resulting in a discussion paper on a theoretical framework for examining motivation among adult distant students - based on observations and trends at New England. The paper attempts to set a context for examing motivation as a variable in involvement in distance study and examines known and likely effects of 'pleasure or profit' motive dichotomy. A framework for examination of such motivational variables is drawn out from observations within the University of New England external student population. The study draws attention to the need for an appropriate use of the 'motivation' concept, and its theoretical and psychological basis. It is an attempt to counter a growing misuse of the terminology as it might apply to students in distance study, and to outline some of the ways and means in which motivation studies might be directed through a suggested schema (Bowlay 1979b).

A third study (Bowlay 1977) is concerned with the progress performance and characteristics of students of mature age (over 25). These adult students werde admitted through 'open entry' schemes to first degree programmes. They (now, in fact, half of the total annual new external intake at New England) compare favourably in retention and achievement with those admitted under normal entry or matriculation criteria.

An interesting, somewhat unusual study has been performed at Murdoch University in Western Australia to analyse distant students' perception of the influences on their studies.
This study investigated the influences and pressures which adult university students perceive as affecting their external studies, i.e. their studies as distant students. An instrument was developed to obtain written responses to objective and open-ended questions about preferred modes of enrolment and factors influencing study patterns. Standard questionnaire responses were augmented by subjects' freely expressed advice to two potential external students, a city housewife and a country teacher. Responses were analysed in eight categories of influence on study, by two independent coders with over 75 % agreement. 43 % of an external sample of 53 and 29 % of a comparable sample of 51 on-campus students said they preferred to study in a combination of external and internal courses. They were agreed that major disadvantages of external enrolment were poor access to library facilities (77 % of externals, 71 % of internals) and inability to understand academics' objectives for courses (70 % of externals, 78 % of internals). Major advantages of external enrolment were related to self-reliance and use of time in organising studies. While common advice was offered to the two prospective students about organisation of studies, there were several significant differences, e.g. the teacher was advised more consistently to organise around outside commitments, and the housewife to attend to the attitudes of significant others and personal motivation (Dodds, Guiton & Lawrence 1981).

The study by Cunningham of Loyola University students (Chicago) that was referred to at the 10th ICCE-Conference in Brighton has since been published as a dissertation. An extract from Dissertation Abstracts describing this study is included in the appendix to this report. Cunningham's study is of some general interest as it has caused some discussion about statistical research methodology (cf. Schuemer 1977).

Longitudinal research on Norwegian students of engineering has been reported on by Rekkedal 1976 and 1978. Willén 1979 (and 1981) has investigated enrolment trends and study problems in a new Swedish scheme for distance study at the university level.

1.3 Course planning and study objectives

Distance educators usually find it important that the aims and objectives of a course should be clarified as far as possible so that there is some certainty that the needs and interests of students are catered for rather than the whims of course developers. This leads to the requirement that objectives should be communicable and be as lucid as possible. Whether they are fully operational in a behavioural sense becomes a secondary consideration only. However, in some cases it is possible to specify concrete behavioural objectives, i.e. to express them in such a way that they list what the students should be able to do after the study.

In this respect, educational technology has influenced distance education considerably. Mager's approach and the taxonomies of Bloom and Krathwohl and their work groups have meant much for the development of distance education programmes since the end of the 1960s. It has been found to be good practice when defining study objectives to avoid verbs of state like know, understand, realise, grasp, master as these are particularly ambiguous. Verbal expressions of action like recognise the symptom of, conduct experiment, demonstrate, do, enumerate, calculate, quote arguments for and against, prove, write an account of, report orally on are examples of expressions found more acceptable in definitions of objectives.

As a rule, it has also been found necessary to decide the extent to which each objective is to be achieved, i.e. how well the student can perform after the training. This can be, and has been, done by grading the required performance, for instance in the following rough manner:
Grade 1: merely recognising the knowledge matter;
Grade 2: performing without answering why-questions; and
Grade 3: explaining and proving.

Other methods of grading performance are to state that students are expected to solve a certain percentage of selected types of problems, give a certain number of examples, theories or reasons or demonstrate something by a certain number of different experiments.

There is general agreement that there are educational goals in distance education that transcend measurable cognitive or manipulative skills. Sometimes training aims at influencing attitudes - for instance making students critical readers, seeing through propaganda and prejudices, or encouraging a feeling for co-operation, understanding, relations to (and treatment of) customers, patients, etc. Cf. Holmberg 1981a pp. 44-48.

Studies conducted at The Open University have made it clear that there are good reasons to regard and apply behavioural objectives with critical judgement. Thus, we must realise that it is almost impossible completely to avoid ambiguity in the formulation of objectives even if we exclusively use verbs of action (do, etc.) and avoid verbs of state (know, etc.). Even action verbs like deduce, recognise and solve have been shown to be ambiguous. This point has been made clear by Deno & Jenkins, 1969, summarised in Macdonald-Ross, 1973, pp. 32-33. 'There is a limit to the extent to which any human can understand the intention of another no matter what, though in practice and in certain circumstances the risk of serious error can be minimised (Macdonald-Ross, 1973, pp. 35 - 36).
A further objection is that defining learning objectives in operational terms, against which their attainment is checked, need not necessarily lead to any kind of proof that the objectives have or have not been attained. It is perfectly possible to make the right operation for the wrong reason, as shown by the following example borrowed from Lewis. Anyone who believes that .3 x .3 makes .9 (instead of .09) and that .2 x .2 makes .4 (instead of .04) will no doubt, on the basis of a false understanding, come to the conclusion that .3 x .5 = .15, which happens to be correct (Lewis, 1974, p. 16). It is evident that the operation is not enough; we must pay attention to the knowledge and understanding on which it is based.

Once it is recognised that the application of a detailed study objective 'needs to be tempered with an understanding of its inherent deficiencies' (Macdonald-Ross 1973, p. 47) there is evidently a strong case for detailed objectives in distance education.

One reason for this is that distance-study courses are prepared in advance and give little scope for improvisation and references to day-to-day occurrences. They can thus be consistently planned to cover what is considered important. This planning usually causes a detailed analysis of what is desired, makes exactitude necessary and provides a basis for judgements of the results of the course, i.e. for evaluation procedures. It would be an illusion, however, to believe that the definition of objectives is normally an initial activity only, completed when the media are selected and the real course creation starts. It is often desirable and necessary to modify the original objectives in the light of information, considerations and experiences made available through the actual development work. Maybe this can be regarded as adherence to Popper's attractive 'piecemeal' approach (a suggestion made by Davies 1978b,pp. 140 - 141).

A question engaging distance educators is how students themselves can influence or even independently decide not only how they are to study but also what, by selecting their own learning objectives. Individualised learning is not brought about by freedom of pace or even freedom of method and medium if others than students decide the content of study. Constructive approaches engaging the students in the selection of study objectives have been developed both by Potvin 1976, and Ljoså & Sandvold 1976. Cf. Bååth 1979, Chapters 13 - 14 and Boud 1981 (1.4 below).

1.4 Course development

A case study of some interest illuminating a consistent application of the systems approach in course development under strong influence of the Keller Plan was conducted by Stanford at the University of Queensland (Stanford 1979). It is relevant both for the approaches of educational technology generally and the so-called mastery learning at the same time at it is a study of the methodology of the teaching of economics.

Another case study reported on is concerned with independence and interdependence in distance education. It is a study by David Boud, the aim of which is to explore ways in which distance-learning courses can be made more responsive to students' needs and to translate a co-operatively (staff-student) designed course to a distance-study setting. It indicates that it is possible to involve students in decisions concerning the total design, development and evaluation of a course in which they are enrolled as distance students and that through this they can develop educational skills which are fundamental for distance learners (Boud 1981).

Evidently the background of the study referred to is the awareness that effective structuring of course content as decided on by a distance-study institution to some extent tends to become autocratic. Distance teaching may then mean 'teacher centred education, where the media are used as substitutes for the teacher, "telling" students what they ought to know' (Ljoså 1977 p. 79).

Most distance-education courses with their various components aim at leading their students straight to specific goals and do so on condition that the students are capable of following the exposition, doing the exercises and solving the problems set. The course developers then tend to regard each study unit as an integral part and thus as a compulsory course component which is only rarely regarded as replaceable.

This all-embracing course structure is often considered too rigid. It is felt only proper that the students should be offered a choice of what units of a course are to be regarded as relevant in each individual case. Such an approach leads to each unit or each small set of units being separate and providing a sufficient treatment of a limited, and strictly defined, part of the subject. When that is the case students can build their own curricula from units or sets of units belonging to different courses. This is what in German is called the Baukasten-Prinzip, the principle of the box of bricks (Ehmann 1976, pp. 15 - 18).

The advantages and drawbacks of self-contained courses vs. study guides as well as problems connected with the development of study-guide courses have been discussed in Ljoså 1975, Holmberg 1977a, Weltner 1977 and Ljoså & Sandvold 1979. Particularly the special potentials of study-guide courses in university study, which requires a presentation of divergent views and different approaches, are being looked into in the latter two papers: extracts from authors representing different approaches can be included in a course reader and a study guide can comment on books and articles (library reading) of various kinds.

Some studies of text structure have been made. In research unrelated to distance study Rothkopf initiated a series of studies on the effectiveness of questions placed before the text passages concerned, inserted into them or placed after them. Not unexpectedly it was found that, whereas introductory questions tend to lead the study to what would answer them specifically to the detriment of the study of other parts of the text, those placed after the text passage have a more general effect, stimulate more careful learning and lead to slower learning of later passages. The delaying effect seems to disappear gradually, maybe because better study skills have been acquired with the help of the questions.

Research at the Open University

> 'supports, but so far does not add to, the practice of inserting into texts higher-level (not rote recall) questions after the relevant teaching material. This practice was adopted at the Open University in 1969 on grounds of common-sense, teaching experience and the distilled experience of practical work on programmed instruction.'
> (Macdonald-Ross 1979a, p. 24)

Studies of text structure implying varying the ideational prominence of a particular topic in relation to other topics have been made without indicating more than that 'the location of information within the content structure of a text does indeed affect learning' (Duchastel 1979, p. 101).

The requirements concerning the lucidity of written presentation have been studied in a way relevant to distance education by scholars analysing the use of English and German printed texts. Langer, Schultz von Thun & Tausch 1974 have shown, on the basis of German instructional prose, that the accessibility of texts - i.e. how intelligible (verständlich) they are - mainly depends on four 'dimensions' of the text characteristics, namely (i) simplicity of sentence structure and vocabulary, (ii) structure and cohesion, (iii) succinctness and relevance, and (iv) additional stimulation. These dimensions are largely independent of one another. Nevertheless, the authors point out that (iii) and (iv) usually influence each other. In the third dimension a medium value (between extreme succinctness, making almost every word important, and long-windedness) seems preferable, whereas the other dimensions denote qualities of positive value for the readability of texts (Langer, Schulz von Thun & Tausch 1974, pp. 13 - 25). Another German study by Groeben, relying more on theoretical considerations than the one referred to, largely supports these conclusions.

The importance of simple grammar for readability and understanding has been shown to be great. The active forms of verbs facilitates reading compared with the passive form, although practice in the reading of passive sentences seems to eliminate this difficulty, which may be an important fact for presentations in German, for instance. Short clauses, many finite verbs, many pronouns, short and well-known words are advantageous from the points of view of readability and understanding (Coleman 1965; Groeben 1972, pp. 18 - 23). Readability problems are particularly great for courses written in German as the German scholarly tradition favours rather a complicated style. However, they are far from negligible in other languages. Research illustrating this based on texts in English has been succinctly summarised by Davies 1971, p. 140. Also compare the following extract from Taylor:

> 'Learners grasp affirmative more easily than negative statements. They understand the active voice more readily than the passive. Equally, a declarative sentence is more easily understood than an interrogative.
>
> 'Abstract nouns make continuous discourse harder to understand. They can, in most cases, be replaced by verbs. For example, "Great emphasis must be placed on the importance of consultation

> of the attached plates in attempting the identification of a particular species", which can be rendered, "We must emphasise how important it is to consult the attached plates when you are attempting to identify a particular species". The use of personal pronouns facilitates the transformation from abstract nouns to verbs. Coleman (1971), p. 167, for example, feels that most of the abstractness in scientific writing can be attributed to the traditional avoidance of the words *I* and *we*. Verbs, on the other hand, increase the ease of presentation. A high proportion of verbs makes understanding easier. However, a difficult passage is not made easier by merely adding more verbs without taking into account the length of sentences or the frequency of occurrence of the verbs. A useful strategy, as already indicated, is to change abstract nouns into verbs. By this means the communicator gains the double advantage of increasing the number of verbs and reducing the number of abstract nouns. Educational psychologists who insist on properly defined behavioural objectives usually make precisely this transformation. They exchange nouns like appreciation, understanding and knowledge for infinitives like to differentiate, to identify and to write (Mager1962). Comprehension decreases as adjectives increase, but pronouns, on the contrary, make the message easier. Miller (1951) found that communications with more pronouns were easier to understand, and attributed that fact to the personal interest they stimulated. Apart from such psychological factors, however, other and more powerful linguistic variables may well be involved. Lastly, prepositions decrease comprehension. The more prepositions, the harder the communication.
>
> 'These findings are broad generalisations derived from correlational studies and should be applied cautiously and intelligently. Until more rigorous and controlled experimental studies are designed, these are all we have.'
>
> (Taylor 1977, pp. 115 - 116)

Without detracting from the appreciation of the studies discussed, at least one reservation should be voiced. We probably have to count with some intervening variables influencing the results. Personal motivation, the standard of prior knowledge and cognitive structure of the students concerned, the time available and other circumstances evidently influenced the results of studies of this kind. Further, we must consider what types of learning are concerned. What is relevant for purely reproductive learning and simple transfer achievements need not apply to problem learning and understanding. A study by Tergan 1979, who expressly refers to this problem, queries the universal applicability of the categories of Langer, Schulz von Thun and Tausch. Some scholars are apt to regard formal text criteria as relatively unimportant in relation to individual cognitive structures and the learning activities of students endeavouring to solve problems (Weingartz 1980. Cf. also Tergan 1979, p. 11).

Readability formulae using word length, word frequency, sentence length and similar measures to predict reading difficulty have been used with success. Naturally, the reservations to other formal criteria of understanding referred to above apply to readability formulae as well. Nevertheless, like the guidelines provided by Langer, Schulz von Thun & Tausch they seem to be very useful. In a critical study of language in texts Macdonald-Ross comes to the conclusion that - in spite of the problems known - a 'readability "filter" is ... more reliable than the exercise of unaided human judgement ' (Macdonald-Ross 1979 , p. 5). He refers to what is known about'the clear relationship between readability and learner acceptability ..., between readability and efficiency of reading. Klare and Smart 1973 found a rank-order correlation of 0.87 between the readability level of correspondence material and the probability that students would send in all their lessons (with length held constant). Such decisively clear-cut field results are not to be put aside lightly' (Macdonald-Ross 1979, p. 4). Cf. Brittain 1972 and Siler 1974.

The compactness of a text, i.e. the degree of succinctness with which something is explained, also influences the readability to a great extent. In most cases, the compactness can be judged in relation to how many words are used per item of information. We may therefore speak of the density of information in a study text. In a scholarly paper the density of information can be extremely high, whereas in a conversation it is usually kept to a level that makes immediate comprehension possible. Faust and Anderson, and Frase and Silbiger have shown the value for motivation and learning of moderate density of information in print. Langer, Schultz von Thun & Tausch stress the importance of avoiding both extreme concentration and long-windedness, whereas other scholars show that marginal information of illustrative value both supports the learning of the main points and is itself incorporated in the knowledge acquired. Rothkopf and Kaplan report after an experiment that 'increases in density of instructional objectives resulted in decreases in the likelihood that any intentional item was learned' (Rothkopf & Kaplan 1972, p. 295). Taylor 1977 expresses similar conclusions like this: 'The effective communicator elaborates his discourse. He identifies the novel and more difficult concepts. He gives examples. He rephrases his exposition and provides repetition ... When the amount of elaboration is low, the presentation is considered difficult. As elaboration increases, the discourse gets easier for the subject. Up to 30 per cent elaboration reduces presentation difficulty. When the amount of elaboration exceeds 30 per cent the presentation gets more difficult. A more general statement of this effect would be that redundancy improves ease of comprehension. This point has received ample experimental support (Miller et al 1951).' Taylor's 1953 study using the 'cloze' technique also illustrated how 'messages with a high level of redundancy convey their meaning more successfully than those low in redundancy' (Taylor 1977, p. 47).

The warning quoted against extreme concentration on the one hand and long-windedness on the other hand, as well as the reservations against formal text criteria as indicators of text effectiveness, may be taken to question how far the educational editing should go to make the reading palatable. Rowntree 1973, quoting Sanders, is quite categorical in rejecting the most readable texts as patterns to be followed:

> 'The more explanatory and "clear" the exposition, the less there is for the student to do. Some texts are so "perfect" as to stifle all real thinking activity.'
> (Rowntree 1973, p.2; Sanders 1966, p. 158)

It is certainly probable that a text that seems too simple and is full of platitudes makes readers inattentive, but in that case that is because the text is unattractive and uninteresting. Most distance educators no doubt reject the assumption that clarity, readability and attractive presentation should not promote reading and learning. The fault with the type of texts criticised by Sanders and Rowntree lies elsewhere, i.e. in the presentation of learning matter as a ready-made system (Lehner 1979; Weingartz 1979 and 1981) instead of as something to be looked into and considered. The texts described do not require of the students that they should ask themselves questions, try possible solutions leading to conjectures and refutations (Popper 1972) or search on their own. There can be do doubt that guiding students in this way is what must be required of study texts unless they aim at providing material for memorising only.

Groeben 1972 expresses views which closely agree with Sanders: 'Do not accept the principle that you must be entirely intelligible to the student.' Groeben recommends what he calls an intermediate degree of intelligibility. It appears probable, however, that what he objects to is not perfect lucidity but the presentation of knowledge as facts and ready-made systems instead of a series of complex problems: 'Do not lack in responsibility in that you enumerate the facts you know.' This could imply an interpretation that agrees with the one I have developed above (Groeben 1972, p. 147).

Techniques have been developed to direct students' attention to important issues, to considering and searching for solutions. Rothkopf's questions referred to above aim at promoting 'mathemagenic-positive' behaviour, i.e. behaviour favourable to learning. The use of questions as attention directors along Rothkopf's line has been criticised. Whereas much research supports it and many agree with Macdonald-Ross in regarding this as support of common sense, others are rather negative. This would seem to apply to Weingartz, who considers formal text criteria fairly insignificant in relation to the basic text design, which may start out from problems to be solved and thus support problem learning, or may simply present ready-made systems of knowledge for reproductive learning, and even more to Marton, who fears that all kinds of attention-directors may avert students' interest from the content to the technical aspects of the reading process, thus encouraging surface learning and leading to neglect of deep structure learning (Marton 1979).

What causes surface and deep-structure learning respectively is far from clear. Macdonald-Ross 1979 relates this problem to principles of linguistic analysis: 'In examining the effectiveness of texts we must be struck with the obvious fact that readers can "read" without understanding, or with confusion, or with positive misunderstanding. Some part of this, perhaps a large part, can be explained by supposing that some clause relations have been inadequately signalled or imperfactly realised. This would be the linguistic substance of the common intuition that in unsatisfactory prose individual sentences appear adequate when seen in isolation, yet, the passage as a whole fails to fit together as a coherent whole' (p. 10).

Considering arguments for and against inserted questions it would seem to be important what type of questions are asked. If they merely concern facts, wordings and examples provided in the text, they may certainly encourage what Marton calls surface learning. Questions causing students to think independently, to formulate their thoughts and relate these to the text are not only radically different from the questions attached to the wordings of texts, but would also seem to be linguistic instruments to encourage problem learning and the type of deep-structure study as Marton & Säljö define this concept (cf. 1.1 above).

On the graphic presentation of texts some research of relevance for distance educators has been conducted. Hartley & Burnhill 1978 and Hartley & Trueman 1979 have contributed some practical guidelines, thus: 'In general ..... a good all-purpose size is 10-point type on a 12-point line to line feed: 8-point on 10-points is possibly as small as one would want to go in the design of instructional materials ' (Hartley & Burnhill 1978, p. 190).

Clarity rather than typographical elegance is usually stressed as important. Thus Hartley and Trueman provide this recommendation:

- Set the text unjustified (i.e.with equal word spacing and ragged right-hand margin - as in normal typescript).
- End each line at a sensible place syntactically (e.g.at the ends of clauses). Avoid word breaks (hyphenation) at line ends.

(Hartley & Trueman 1979, p. 102).

Weaving texts and pictures into one integrated lexi-visual presentation including explanatory drawings and text units, panoramic pictures and photographs of details, documentary illustration, etc, has been tried with success and is evidently of form of presentation that distance educators will have to look into further (Lidman 1979). To illustrate processes and procedures by a series of consecutive drawings with verbal comments and to base verbal explanations entirely on pictures are techniques that are being practised with varying success. The printed part of a course may consist mainly of pictures on the basis of which oral instruction is given on audio-tape or radio.

A valuable contribution to the theory of graphic elements has been offered by Waller, who has developed the notion of access structure. His thinking is based on the insight that the normal way of reading is selective. We do not normally read every word or from the top to the bottom of a page, but look for what is relevant to us at the time of reading. What a reader needs is, according to Waller, help both to plan and execute his reading strategy. Here, lists of content, statements of objectives, surveys and explicit suggestions may be helpful for planning. Graphical devices, eg. headings, are useful for the execution in that they, as Macdonald-Ross says, signal 'the status of the communication to the reader' (Macdonald-Ross 1979 , p. 30).

Another relevant approach is one presented by Doerfert on the basis of information theory and the so-called redundancy theory developed by von Cube. The formation of 'supersigns' is regarded as particularly important for learning efficiency. Supersigns are comprehensive concepts inlcuding 'signs' on a lower level in the way a word is a supersign in relation to the individual letters that it is made up of. According to von Cube, supersign formation is an effective means to bring about 'redundancy' as this concept is understood by him.

Von Cube's theory is based on a cybernetic approach mathematically defining the probability of what a student can foresee. The gist of the redundancy theory can be described as follows. Each study task contains a certain amount of information that is to be absorbed. Each item of prior knowledge and each step on the path of learning leads to a reduction of the amount of information left, and so does the capacity to form supersigns with the inclusion of new knowledge matter in its proper context. To the individual student the task then contains redundant information apart from what remains to be learned. The more that is learnt, the smaller the amount of remaining subjective information and the greater the redundancy. Felix von Cube explains all learning processes by means of this theory. The fact that meaningful material is learnt more quickly than meaningless material is explained by the higher statistical redundancy in the meaningful material: thus the amount of information per unit to be learnt is lower than in the meaningless material. Similar illustrations are given of conditioning and learning by success (von Cube in Ruprecht et al. 1975 and elsewhere).

Doerfert applies this thinking to the use of graphical elements in distance-study courses. The use of structuring key-words in the margin to denote essential concepts in the course presentation has been tried with success: these key-words reproduce the content of the course unit as a kind of abstract and, according to Doerfert, in this way facilitate the formation of supersigns favouring redundancy (Doerfert 1980). Various typographical measures including the use of italics, underlinings, etc. which serve the understanding of relations between concepts and other items of a presentation are also seen as facilitators of supersign formation.

From other points of view, Waller tends to reject general information theory as 'unhelpful and somewhat misleading'. 'Information theory while having a limited direct impact on the study of graphic communication, left a metaphor for communication, reflecting the transient nature of electronics signals rather than the permanence of the printed media' (Waller 1979 p. 213). Following Hatt, Waller favours 'a taxonomy of communication outcomes in which the rejection or partial use of a message is seen as quite valid and not necessarily inconsistent with adequate comprehension' (Waller 1979 p.216). He further argues that 'the construction of a text (or diagram) is itself part of the process of organising and structuring ideas' (Waller 1979, p. 220) and discusses graphic devices as aids to problem-solving. Here, in accordance with his selectivity approach mentioned above, he refers to cases 'where the sequence and strategy for obtaining information is determined largely by the reader, and is conditional on, firstly, his goal and secondly, on the outcome of various steps in the problem-solving process' (Waller 1979, p. 221).

There is a wealth of literature on graphic design, a subject which is by no means relevant to distance education only, but concerns all types of textual presentation. A comprehensive bibliography listing works on most aspects of graphics in texts has been published by the Institute of Educational Technology of The Open University (Macdonald-Ross & Smith 1977). The journal "Instructional Science" in 1979 devoted a whole number to graphic communication in which articles by Waller, Macdonald-Ross, Fleming, Szlichcinski, Kinross and Hartley illuminate several important aspects of of the subject (Instructional Science 8, 3).

.5 Media

Comparatively little research seems to have been done during the last few years into principles for the choice of media in distance education. This is no doubt due to the fact that the attempts made so far to create a media taxonomy have been in vain. In distance education the selection possibilities are often extremely limited. The printed and written word on the one hand and audio recordings on the other sometimes exhaust selection opportunities. In some cases TV and radio programmes can be included and, mainly where study-centre facilities are provided, video recordings (The Open University, FernUniversität, e.g.). A German study by Schwittmann 1979 shows the predominance of written study materials also in a system including broadcasting as a constitutive element. On the use of face-to-face sessions as a supplementary medium see below.

A scrutiny of the 'didactic potentials' of media combinations related to theoretical considerations occurs in Dabrowski 1976.

A notable practical attempt to structure the thinking about the use of media or communication techniques in relation to the educational objectives aimed at has been developed by John Sparkes (Sparkes 1979 and 1982).

Various studies of the use of different types of media have been performed. The Institute of Educational Technology (IET) of The Open University has contributed much in this respect.

The specific functions of the printed word have been looked into by Peters 1979, and interesting studies of the use of audio cassettes in distance study have been presented by Fritsch 1978, Leslie 1979 and McDonald & Gough 1980. The latter study shows that audio cassettes were highly valued by students and listened to seriously whether they were deemed essential or only for enrichment. Many students listened to types more than once, took notes and used them in preparation for assignments or examination revision. The motivating value of audio cassettes and their value in reducing feelings of isolation was emphasised by a substantial number of students. Suggestions were made by respondents for improving the quality and usefulness of audio cassettes.

Important research and development work has been done on the use both of the telephone and the computer in distance study. As these media mainly serve purposes of two-way communication they will be dealt with in the following section of this report.

1. 6 Non-contiguous tutorial two-way communication

A very thorough empirical investigation of postal two-way communication in distance study has been made and published by John Bååth (Bååth 1980).

The purpose of this study, as summarised by the author, is to shed light on certain problems related to the postal two-way communication between student and tutor in correspondence education. The three main problems concern (1) the submission density, i. e., the density of postal contacts brought about by means of assignments for submission; (2) the possibility of replacing a substantial part of the assignments for submission by self-checking exercises; (3) the possibility of computerizing the routine parts of the correspondence tutor's work.

The approach is experimental. In all, 1805 adult students of regular Swedish, Norwegian and British correspondence courses in English as a foreign language, Psychology, Economics and Physics were randomly allocated to experimental groups with (1) varying submission density, (2) varying numbers of assignment questions (omitted questions being replaced by self-checking exercises), and (3) traditional versus computer-assisted postal tuition. Data were collected by means of questionnaires and final tests, as well as from a special register of students.

High submission density, i. e. frequent postal contacts (due to short study units), was found to correlate with a stronger inclination to start the submission of assignments. This was the only substantial and unequivocal result of the experiments on submission density, however.

With regard to the second main problem, it was found that half and even three fourths of the assignments for submission could be replaced by self-checking exercises, with practically no appreciable effects either on study perseverance or on attitudes, final test results or study time.

The computerised postal tuition was experienced as more positive by the students than traditional tuition. Moreover, students getting computer-assisted correspondence tuition started submitting assignments to a greater extent than students receiving traditional tutoring by mail. In one of the two experiment courses, they also completed their studies to a greater extent, and did so within a shorter time.

Bååth's study is an outcome of the EHSC-Lund University research project on two-way communication in distance education. So is a study by Flinck (Flinck 1978) on correspondence education combined with systematic telephone tutoring. Telephone tutoring proved to have a positive effect on the achievements of students of a foreign language but not on the achievements of students taking another subject (Economics). Whereas students reported that they were given valuable encouragement by telephone tutoring no difference in study time between students tutored by telephone and those doing without telephone tutoring was found. The study indicates that telephone tutoring led to increased interest in the subject studied whereas the telephone contacts seemed to exert no influence on the feelings of isolation usually expected of distant students. Interestingly enough a comparatively small group of the students acknowledge feelings of isolation (35 % vs. 47.5 % who expressly declare that they have no such feelings).

Further studies on the use of the telephone for individual tuition and for teleconferencing have been made by Ahlm 1972, Turok 1977 a und b , Holloway & Hammond 1975 and others.

The use of the computer in distance education has been studied in various contexts. So far for financial reasons the most promising use of the computer in distance education seems to concern off-line systems. Fully developed systems of this kind like CADE (Hermods, Sweden) make use of a computer off-line for the correction of and commenting on replies to multiple-choise questions with carefully selected distractors. In the CADE system an optical reader 'corrects' the solutions of the students, after which the computer selects relevant comments and explanations from among a great number of those programmed and stored for the purpose. The computer also checks and refers to the individual students' earlier achievements when parallel or similar problems have been solved. A mistake or unsatisfactory solution of a problem can be, and is, given different comments according to which of the incorrect distractors the student has chosen, i.e. in relation to the way in which he or she has misunderstood or wrongly combined items. The computer programmes see to it that sometimes even correct replies are commented on to underline something important or to support the motivation of the students. Encouraging and counselling comments based on the total result of students' papers are also provided by the computer. All this is typed out by the computer onto a personal letter addressed to the individual student.

This use of the computer is based on so-called objective assignments of the multiple-choice type which, though regarded with some suspicion, have proved to be acceptable and to some extent very useful for some didactic purposes. Their value varies with the way in which they have been worked out and tried out and particularly with the suitability of the distractors.

A computer system which allows the free rendering of replies in the form of figures has been developed in Germany (CMA, FernUniversität). The numbers are 'read' by the computer, not by 'mark sensing' but by the numbers being produced through markings in columns of numbers provided. Thus, there is no choice between different solutions suggested. The students create their own answers (numbers) (Graff 1977, Möllers 1981).

An evaluation study of the CADE system supports Bååth's finding quoted above that computer-assisted versions lead to better completion rates than tutor-marked versions of the same courses and also exert favourable influence on students attitudes to the tutorial work (Bååth & Månsson 1977). Similar work done in the USA is described in Brittain 1973. Cf. also Lambert 1977 and Lampikoski & Mantere 1976.

This positive view of off-line computer-assisted distance tuition can hardly be interpreted as a general recommendation to do without tutor-marked assignments or personal non-contiguous communication generally. A number of subjects, themes within subjects and general types of learning, e.g. free problem-oriented learning, make it imperative that live tutors communicate with students.

On-line use of computers in distance study occurs where students can be offered the possibility to work at computer terminals in study centres. This application of computer-assisted learning has been studied an The Open University, for instance. The experiences are very favourable (cf. Lockwood & Cooper 1980). As a new development should be mentioned an instrumentarium developed to make it possible for blind students to work at computer terminals. A blind student types a question into the computer to which it replies in an artificial voice. This is brought about by means of a micro computer combined with a 'voice synthesizer' which has 62 phonemes at its disposal. The result is an artificial but easily intelligible English. Experiments have also been made with oral instructions received ('understood') by the computer (Vincent 1981).

Empirical studies have shown conclusively that there is a distinct correlation between turn-round time - i.e. the time elapsing between students' dispatch of assignments completed and their return - and course completion (Rekkedal 1973; cf. Bååth & Månsson 1977). Quick handling with proper tutor comments on students' papers has proved essential for students' success.

Further studies on non-contiguous two-way communication have been reported on from Australia, Canada and Great Britain. A Murdoch University study of student feedback in teaching and improving an external mathematics course resulted in a simple but useful strategy for obtaining student suggestions for the improvement of this course. It involves the continuing use of short questionnaires, which become more specific as the major difficulties encountered by the students are revealed, and does not require large resources or very much time. Moreover it appears to encourage students to think critically about the course and their involvement in it and to provide a means for them freely to communicate their thoughts and frustrations about the course (Kloeden & McDonald 1981).

Tutor skills for telephone tutoring have been studied at Athabasca University in Alberta with a view to developing a training programme for telephone tutors (Williams, year?) and also as an elucidation of motivational aspects, the tutor as an agent of motivation and the effect of an incentive-pay scheme for tutors which calculated their fees on the basis of learner completion rates (Coldeway, year?).

A study made by the Rapid Results College in London of students preparing themselves for the examination of the Institute of Bankers in Scotland showed that the average number of assignments submitted by those passing the examination is noticeably higher (+ 24 per cent) than the average number of tests submitted by those failing the same examination (no report published; information provided by the Principal of the College, Mr. D. M. Young).

The possibilities and limitations of multiple-choice items in assignments and exercises have been looked into by Bååth & Månsson and Friedrich, Klemt & Schubring 1979. Possibilities and shortcomings of multiple-choice items are analysed against the background of relevant literature and the authors' experience of a multi-media distance-study system.

Studies by Lampikoski & Mantere 1978 and MacDonald & White 1981 are relevant in the context of non-contiguous two-way communication. On these studies see further below.

Further should be mentioned a thorough study by Valkyser 1980 of various components of the non-contiguous two-way communication (communication in writing inclusive of the use of pre-produced text modules, telephone communication and communication by means of audio cassettes). Students proved to appreciate these types of communication as essential elements of the tuition offered to them.

A survey of the problems related to non-contiguous two-way communication has been produced by Holmberg 1981d.

The situation of distant tutors is the subject of studies by Harris 1975, Gibbs & Durbridge 1976 and Fritsch 1980 and 1981. Other, mainly somewhat earlier investigations into tutors' status, qualifications, tasks, attitudes and influence on students' work have been summarised by Bååth 1980, pp. 36 - 40.

1.7 Face-to-face sessions

A number of studies have shown that cognitive objectives in general and psychomotor objectives aimed at skills in the field of written achievement (in languages and mathematics, for instance) are attained at least as well by distance study based on the written word as by conventional classes (Granholm 1971). There seem to be 'no studies of achievement which show that correspondence study students do less well than do classroom students, a number which show that they do as well, and a number which show that they do better' (Childs 1965, p. 81). It is difficult to generalise the relevance of such statements, however, as some comparative studies do not seem clearly to have kept all independent variables under control.

On the one hand this knowledge about the effectiveness of distance study and on the other hand research indicating that many psychomotor objectives and objectives in the affective domain are more effectively attained by personal contacts lead many distance-study institutions and their students to use face-to-face sessions mainly for the purposes of

- practising psychomotor skills in laboratories and under similar conditions; also verbal skills through personal communication;
- facilitating the understanding of the communication process and human behaviour;
- encouraging attitudes and habits of relevance for the study;
- mutual inspiration and stimulation of fellow students;
- training in co-operation.

A question that is under debate is to what extent face-to-face sessions should also, more or less as a matter of routine, be used for the purpose of securing cognitive learning by discussion and application of the knowledge acquired to themes brought up in direct contact with tutors and fellow students. Whereas one school of thinking finds face-to-face sessions essential, another finds them unnecessary and even, in some cases, harmful. No conclusive proof has been established either to prove the necessity of face-to-face elements or to reject them as conventional embellishments. However, particularly in cases where course completion within a pre-determined period of time is a target, students using supplementary face-to-face sessions have often been found to be particularly successful. A study by Beijer showed that above all the 'very youngest students (youth of school age)' were 'keen on having correspondence education supplemented by oral course features'. Beijer adds that 'there is a tendency to set greater store on traditional correspondence education with increasing age' (Beijer 1972, p. 89). Evidence to the contrary, as far as the age groups are concerned, has been reported by Wångdahl 1979.

There is some evidence that efficient tutors in a class or group are apt to take command and teach, instead of guiding or advising, thereby depriving students of the initiative and taking over part of the function of the self-instructional course. This often leads to the students being given too much instruction (the tutor doubles the course), and to their being to some extent put in conflict because of differences of approach between the course and the tutor, a confusion which is always time-consuming but may be productive in academic study.

One form of integrating distance study with face-to-face sessions that has been found profitable is running concentrated residential courses supporting individual distance study. These can help students over previously insurmountable difficulties, they can introduce and thereby facilitate the study of new parts of the distance course, they can inspire co-operation with fellow students and provide a pleasant academic atmosphere with motivational potentials (Holmberg 1977c). As they take place during concentrated periods, when an interruption is made in the individual distance study, they do not interfere with or disturb this.

A successful application of face-to-face sessions to a distance-study programme can consist of voluntary orientation programmes for newly enrolled students, for instance weekend courses. Bowlay 1980 reports on such orientation programmes covering academic, administrative and student-support areas with emphasis on establishing student interaction and mutual support. His study indicates positive correlation with higher retention and achievement rates for orientation programme participants.

A successful combination of distance study and face-to-face instruction has been developed for 'supervised' correspondence study in schools, in companies and organisations, including military units. An example of supervised correspondence study is that the students work in libraries or classrooms and have a teacher available there as a resource. He or she is their individual adviser and helper rather than their instructor, answers questions, explains when asked to, motivates, organises group activities and administrates.

The learning matter is presented throughout by the course, which may be based on several media, and the didactic communication with the distance-study school remains an essential element (Childs 1963, Holmberg 1973, Weissbrot 1969).

The influence of supplementary face-to-face sessions on study success has further been studied by Bolte, Böhme & Schwier 1974, Lockwood 1973, Müller 1974, Ness 1976, Smith 1976 and others, who testify to their effectiveness. A comprehensive analysis of the use of study centres and study-centre networks, particularly in the Australian context, has been made by Gough 1980. Cf. the German *Modell* .... 1975. The functions of work groups organised by students in a German setting have been studied by Kolb 1978. General surveys of the problems and opportunities offered by combinations of distance study with face-to-face elements are provided in Holmberg 1977b and in Müller 1981. For a general discussion of these problems see Daniel & Marquis 1979.

1.8 Counselling

At least three major studies on counselling distant learners have been made during the last few years: an analysis of the thinking behind and the practice of the Open University counselling and tutoring (Sewart 1978), a survey of trends and literature in the field by Thornton & Mitchell 1978 and a case study by Roger Lewis 1980. Thornton & Mitchell illuminate institutional practices mainly in Australia but also with overseas references. They discuss correspondence counselling, audio cassette counselling, telephone counselling and face-to-face counselling.
Lewis' case study includes a comparison of one group of experimental students with two control groups. The experimental group was supported by personal counselling in writing, on the telephone and, though less frequently, face-to-face. Progress was measured and problems of the experimental group and their interaction with a counsellor were analysed. The experimental group, provided with a local counsellor, performed better (judged by course results) than the control groups.

Earlier findings concerning the value of encouraging letters sent to students who have not submitted assignments for a period or have otherwise deviated from their plan of study were confirmed by a study of Rekkedal's (1972b).

Attempts have also been made to make use of the computer for counselling purposes. An application of this kind is to be found in a pre-study advisory system developed at the Fernuniversität in Germany. In connection with an informative booklet a number of questions are asked. The foreseen replies to these, in their various configurations, are commented on by computer through the automatic selection and use of pre-programmed text modules (Fritsch, Küffner & Schuch 1979).

1.9 Institutional planning, organisation and administration

The systems approach to distance education has been studied and applied in different contexts. On its principles in the context of organisation see, e.g., Erdos 1975, Graff 1977 - 1978, Østlyngen 1979 and Wedemeyer 1981, pp. 132-158. Wedemeyer expressly relates institution building to systems evaluation.

New approaches to planning, organisation, decision making, control and systems evaluation in distance-study institutions have been introduced by Rumble (Kaye & Rumble 1981). His contributions are almost exclusively relevant to distance-study universities, however. Rumble shows conclusively that planning, control and evaluation are most important activities in which academics and administrators have to co-operate and that success largely depends on a good data base.

A planning study made for open university activities in El Salvador by Pantoja 1981 reveals the same needs, objectives, problems and possibilities for distance education in El Salvador as are known from other countries with long experience of distance education.

A fairly sophisticated study divided into several sub-projects based on theoretical and empirical research has been carried out and reported on by Lampikoski & Mantere 1978. A plan for the operation of an objective-guided distance-education systems as well as various methods to carry it out in practice were developed and tried out to meet the requirements for continuing education and training in the field of marketing in Finland. This study indicates that success is largely dependent on reliance on a combination of theoretical and empirical work.

A comparative examination of seventeen tertiary institutions providing distance education in Queensland, Australia, has been carried out by Goodman. The report is not available when this is being written.

The use of PSI approaches (the Keller plan) to distance education has been studied by Holmberg 1981c and Spencer (year?), both testifying to the effectiveness of PSI. Spencer's research showed that PSI produced high completion rates and that a PSI version of a course was considerably more expensive to deliver than other versions. Cf. also Stanford's case study (1969) referred to above under 1.4.

In university distance study flexible pacing is something of a matter of contention although complete flexibility has proved effective in distance study at other levels. Several distance-study universities do not allow their students to pace their studies according to their individual needs and wishes. However, in many cases it has proved counterproductive to send study material on dates decided on in advance without paying attention to individual student's needs, as such a great number of course units can be ammassed on a slow-working students desk that he feels frustrated and discouraged from starting. This has been shown, for instance, by Bartels & Fritsch 1967. Cf. further Daniel & Marquis 1979, Graff, Holmberg, Schuemer & Wilmersdoerfer 1977. A study by Schwittmann 1979, which mainly concerns German conditions, illuminates the problems connected with distance-study systems of the types that oblige students to adapt themselves to prescribed pacing.

An experiment with flexible pacing of distance study has been carried out at Murdoch University in Western Australia which, like other Australian universities, has on the whole adhered to a rigid pacing system. The general level of support from both academic staff and students for the experimental flexible pacing design as well as the comparable levels of academic performance among students of a control and an experimental group, gives some confidence that flexibility of pace can play a valuable part in distance university teaching (McDonald, Sansom & White 1981).

Regulations and legislation regarding distance education have been analysed in a study prepared for Unesco on behalf of ICCE by Gunning 1978. This is a survey of five countries with recommended guidelines for developing countries. Fairly detailed information is provided about the situation of distance study in the United Kingdom, the USA, France, India and the German Democratic Republic.

A comprehensive comparative study of distance-education systems is reported on in Karow 1980, a work which contains much relevant information otherwise not easily available.

Attempts to develop typologies of university distance-education systems have been made by El Bushra 1973, Kyrö 1980, Kaye (in Kaye & Rumble 1981) and Holmberg 1981b. These typologies are concerned with independent distance-study universities, distance-study departments of conventional universities, service institutions providing distance-study facilities on behalf of universities, co-operative models etc.

Dahllöf 1977 has made an illuminating comparison between Australian and Swedish higher education against the background of the discussions concerning a central distance-study university.

Sims' inquiry into correspondence education processes, the ICCE-Unesco study of 1977, which was discussed at the 11th ICCE conference in 1978, remains an up-to-date general examination of distance-study systems in action.

1.10 Economics of distance education

A number of studies of the economy of distance education have been made and published. They almost invariably show a high degree of cost-benefit and cost-effectiveness in distance-study systems. Studies by Neil, Rumble & Tout 1979, Perry 1976, Rosenquist 1975, Staaf 1973 and Wagner 1972 and 1977 belong to the most informative publications on the economy of distance education. They have been summarised and discussed in Holmberg 1981a, pp. 115 - 124. A special up-to-date study concerned with the economics and management of small distance-education systems is Snowden & Daniel 1980.

Very recent and valuable contributions to the study of the economy of distance study at the university level, particularly activities of

The Open University type have been provided in two papers by Rumble in Kaye & Rumble 1981. A new system for budgetery and resource forecasting is introduced.

The cost-effectiveness of the use of media for basic and rural education in developing countries is being studied by Perraton & Jenkins. This research includes a study of relevant literature and case studies in Malawi and Cameroun. When this is being written no report is as yet available.

1.11 Evaluation

During the latter half of the 1970s interest in evaluation of distance study has been great. A number of studies are concerned both with the evaluation of distance-education systems and the evaluation of course materials and teaching.

A series of valuable analyses of the various problems connected with the evaluation of distance study is to be found in the proceedings of an Australian workshop held at Townsville College Advanced Education (Armstrong & Store 1980). The keynote address by Stephen Kemmis illuminates some of the most important philosophical considerations behind course evaluations. The general tendency of this paper is evident from its title: Program Evaluation in Distance Teaching - Against the Technologisation of Reason. Thinking behind distance-study evaluation has been illuminated by Gooler 1979. An attempt to present the most important principles and procedures of course evaluation was further made at a European workshop in 1980 (Holmberg 1980).

Evaluative studies of distance-education systems have been presented by Biswal 1980, B. Singh 1978, M. Singh (year?) and Lampikoski & Mantere 1978. The 'state-of-job readiness' achieved by correspondence graduates was studied and found to be high in Woolsey 1974. Similar results are reported on by Neumann & Müller 1976.

A great number of course evaluations have been reported on, thus, e.g. Bowlay 1980, Friedrich & Kucklick (year?), Kurbjuhn 1980 and 1981, Stanford & Imrie 1980 and Tergan 1980a. For summaries see the appendix.

The University of New England in Armidale, Australia, has published self-interpreting statistical summaries and reports 1977, 1978, 1979 and 1980. PBNA in the Netherlands reports on favourable experiences of formative evaluation of distance-study courses (Verslag .... 1981), and so does the British College of Estate Management (research by J. Harvey).

A so far unpublished study of a project run by the International Extension College in Cambridge, UK, indicates that multi-media techniques can be successful in reaching unemployed school leavers and helping them.

Some drop-out studies related to course evaluation have been made, thus by Houtkoop 1981a - b as part of a longitudinal research project performed by the Kohnstamm Institute in Amsterdam. On drop out generally see above section 1.2.

A study by Balay 1978 reveals the importance of personal interaction between students and tutors. This study is concerned with youngsters taking correspondence courses. A case study of the investigation process applied in a drop-out study has been presented by Malley, Brown & Williams 1976. It illuminates the drop-out problem but at the same time represents a kind of meta theory analysing relevant research methods.

1.12 History of distance education

Whereas Battenberg 1971 discovered an advertisement in the Boston Gazette of March 20, 1728, about the provision of self-instructional material in shorthand (and possibly correspondence teaching), Bratt 1977 (as discussed by Bååth 1979, p. 13) quoted the following advertisement of 1833 (in Lunds Weckoblad, Lund/Sweden), which explicitly refers to postal teaching:

> A card.
> The undersigned respectfully intimates to those Ladies and Gentlemen, in the adjacent Towns, who study Composition through the medium of the Post that the Address for the month of August, will be Little Grey Friars Street, Lund.
>
> A. J. Meuller

Some notable publications on the history of distance education have appeared during the last few years. Among these are two papers by Delling, on which see below, and further Gerrity 1976 on college-sponsored correspondence study in the United States, a comprehensive study by Gaddén 1973 describing (in Swedish) Hermods in Sweden during its first 75 years, Ehmann's German work on the introduction of university distance study in Germany (1978), a study by Jenkins & Perraton 1980 analysing the development of the British International Extension College 1963 - 1979 and an historical overview, on the basis of a discussion of essential principles of non-traditional learning, in Wedemeyer 1981, pp. 199 - 219.

In an interesting paper by Delling 1978 the exchange of letters as a precursion and part of distance education is looked into. Delling 1981 has further contributed pioneering work on the beginnings and early development of distance education in Germany.

1.13 Distance education in developing countries

Some studies have been concerned exclusively with the special problems of distance education in developing countries. A comprehensive survey of principles, practices and problems was presented by Hakemulder 1978. A discussion of the social backgrounds and general principles of distance education in developing countries occurs in Young, Perraton, Jenkins & Dodds 1980. This study makes information available on important non-formal distance-teaching projects in the Third World. Comprehensive studies of Indian distance education have been made by B. Singh as summarised in his book of 1978. M. Singh (year?) has analysed the teaching of English by correspondence in the Indian context.

A project loosely connected with distance education concerns the identification of the educational needs of rural people in Africa (Kooijman 1980). On the basis of participative observations the author concludes that the type of formal education, which is accepted and valued, has failed to prepare people for life. Non-formal education should develop skill-training programmes based on recognised needs.

1.14 Guidelines for distance educators

The need to bring about professional training for distance educators has apparently been felt acutely in various parts of the world. Quite a few handbooks for distance educators and similar documents have been made available, among them Dewal et al. 1981a and b, Handbook for part-time tutorial and counselling staff (1977), Handbook for course team chairmen (1977), both of which were produced at The Open University, Holmberg (& Bååth) 1982a (the second, revised edition of a handbook of 1974), Jenkins 1981, Lambert & Welch 1980 and 1981, Manual for Tutors of External Studies (Western Australian Institute of Technology 1975), McDonald & Guiton 1979, Meacham et al (year?), Nölker & Schoenfeldt 1976, Tutoring at a Distance (an occasional newsletter published by Murdoch University, Western Australia), Vallières et al. 1972 and Veiledning for brevskolelaerere 1977 (Brevskolerådet Norway). Distance-study courses for distance educators have been developed at the FernUniversität in the Federal Republic of Germany (Holmberg 1982b), NKS in Norway (Ljoså 1978), and NKI also in Norway (Rekkedal 1979). A graduate course on distance education using printed material and audio tapes is being developed at the Adelaide Open College of Further Education in South Australia, and a correspondence course on the subject is being prepared by the European Home Study Council.

1.15 Research on reseach

A survey of institutes concerned with research into distance education listing 15 such institutions has been published by Raggett & Crooks 1980. A handbook on research into distance teaching has been developed by Mitton 1981. It contains practical advice on research methods and includes appendices on statistical theory, costing and other concerns.

APPENDIX

Summaries submitted of research projects too special or technical to have been summarised in the above presentation

1 - A descriptive and exploratory study of the correspondence study division of a privately based institution in a large metropolitan area.

- This is a dissertation which was, in outline, brought to the attention of the 1975 ICCE conference (Cunningham 1975 and 1976) and was later commented on in the ICCE Newsletter (Schümer 1977).

'Three-dimensional chi-square analysis (2 x 2 x n, n = 2 to 12), was used to test the significance of associations among variables available in data of the Correspondence Study Division, Loyola University of Chicago. The three-dimensional hypotheses tested were:

1. Student motivations show no relationship to the completion or non-completion of courses considered as either upper or lower division courses.
2. Whether a correspondence study student is a former university student or a non-student is not related to the age range or to motivations of professional improvement or of culture and continuing education.
3. Student motivations for taking either Education 320 (Philosophy of Education) or Education 230 (Introduction to Educational Psychology) are not related to completion or non-completion of these courses.
4. Student motivations for taking either Education 310 (General History of Education) or Education 220 (American Education) are not related to completion or non-completion of these courses.
5. There is no relationship between completion and non-completion of courses and the grades students receive, where the same course is taken from different teachers.
6. The levels (upper or lower division) of courses students take are not related to their motivations of either professional improvement or continuing education, nor to the rates of completion of the courses.

The investigator used all available student enrollment data for 1969, 1970, 1971, and the total of the three years. At the 0.05 level significance, there was significance in the data from all years in Hypothesis 6. Hypothesis 5 possessed significance when it was modified in two ways: (a) as a study of completions and non-completions; (b) as a study of all possible grades received ...' (Dissertation Abstracts 36, 4 / 1975).

- Father D. M. Cunningham, S.J., Ph.D.,
  Loyola University of Chicago
  Water Tower Campus
  820 North Michigan Avenue
  Chicago, Ill. 60611 , USA

2 - Learning from Text

- Interdisciplinary studies on learning from texts are presented with their basic theoretical problems and practical applications. At first models describing complex meaning structures (text structures and knowledge structures) are discussed. The comprehension process is seen as a constructive activity on the part of the learner, in which several subprocesses functioning in reciprocal interaction can be differentiated: construction of the text base, elaborative processes, reductive processes, processing cycles. Retrieval of what has been learnt is considered as active (re)construction, too. The differential aspects of learning from texts which so far have received little attention, are taken into consideration. Subsequently, possible applications within the two problem areas 'readability and comprehensibility' and 'learning control' are discussed. The existing research findings are assessed on the basis of the reported approaches on learning from texts. An outlook is given on possible directions for future research.

- Professor Heinz Mandl, Mr. Steffen-Peter Ballstaedt,
  Mr. Wolfgang Schnotz, Mr. Sigmar O. Tergan
  Deutsches Institut für Fernstudien an der Universität Tübingen,
  Hauptbereich Forschung, Bei der Fruchtschranne 6,
  D-7400 Tübingen 1, Federal Republic of Germany

  Report:
  Lernen mit Texten.
  DIFF-Forschungsberichte 5 (1975)
  Tübingen: Deutsches Institut für Fernstudien an der Universität Tübingen.

3 - From comprehensibility to text comprehension

- Concepts of readability research, the so-called 'Hamburger Verständlichkeitskonzept' (Langer et al., 1974) (concept of comprehensibility) and the concept of Groeben (1972) are outlined and subjected to critical scrutiny in the light of the approach based on reader-text-interaction. A re-orientation of comprehensibility research due to the consideration of information processes is considered. Reference is made to the constructivist theory of comprehension of Bransford and co-workers, the cyclical processing model of Kintsch & van Dijk (1978) as well as to the approaches on schema-theory and the theory of inferences. In the third part, the aspects of text comprehension conducive to learning are focused upon. They are discussed with respect to information processing, whereby problems concerning text organization, learning aids in the text and learning strategies are pointed out by way of examples.

- Professor Heinz Mandl, Mr. Sigmar Olaf Tergan, Mr. Steffen-Peter Ballstaedt
  Deutsches Institut für Fernstudien an der Universität Tübingen,
  Hauptbereich Forschung, Bei der Fruchtschranne 6,
  D-7400 Tübingen 1, Federal Republic of Germany

  Report:
  Textverständlichkeit - Textverstehen.
  DIFF-Forschungsberichte 12 (1981)
  Tübingen: Deutsches Institut für Fernstudien an der Universität Tübingen

4 - Text-comprehensibility and learning success in independent study situations

- Traditional readability and text-comprehensibility concepts were analyzed and evaluated with respect to theoretical foundation, operational definition, generalizability, practicability and implications for designing written independent study materials. An experimental study designed to test the effect of text-comprehensibility and adjunct study aids (instructional objectives, adjunct questions) was performed under natural independent study conditions. 139 students participating in an independent study course (Funkkolleg 'Beratung in der Erziehung') studied experimental versions of the original written course material varying in text comprehensibility and type of adjunct aid in the texts used. The content of the texts was the same for all students. A 4x2x2 factorial ANOVA was performed, the factors being 'text comprehensibility' (four levels measured by means of a rating procedure proposed by Langer, Schulz von Thun & Tausch, 1974), 'taxonomy-level of instructional objectives' (two levels: knowledge, comprehension), 'taxonomy levels of adjunct questions' (two levels: knowledge, comprehension).

The results showed some significant effects regarding factual knowledge performance measures but not regarding comprehension measures, the effects, however, being of little educational importance. A stepwise multiple regression analysis showed that performance variance was highly attributable to learner characteristics (background knowledge, ability level, motivational and study competence factors). The results were interpreted in the light of a learner-text-interaction model with respect to theoretical assumptions on self-directed learning, to modern theoretical conceptions and text comprehension (Spiro, 1977; Kintsch & van Dijk, 1978; Kintsch & Vipond, 1979) and to the information processing model of human cognition proposed by Andre (1979).

This is a doctoral thesis, to be published in 1982 by Deutsches Institut für Fernstudien an der Universität Tübingen.

- Mr. Sigmar O. Tergan
Deutsches Institut für Fernstudien an der Universität Tübingen,
Hauptbereich Forschung, Bei der Fruchtschranne 6,
D-7400 Tübingen 1, Federal Republic of Germany

5 - The effects of intelligibility of text and type of orienting direction on correspondence student posttest performance level

- The study examines the effects of intelligibility of text, position and cognitive level of inserted questions on performance level under field experimental conditions. A 4x2x2x6 analysis of variance with repeated measures on the last factor (type of post-test performance) showed a significant main effect of the intelligibility factor with respect to post-test performance. A significant interaction of intelligibility of text and position

of inserted questions was observed with posttest items.
The results are discussed with respect to (a) study time needed and (b) the validity of the underlying "Hamburg Concept of Intelligibility" (Langer et al.) and the "concept of mathemagenic activities"(Rothkopf) for "realistic" correspondence study situations.

- Mr. Sigmar O. Tergan
Deutsches Institut für Fernstudien an der Universität Tübingen,
Hauptbereich Forschung, Bei der Fruchtschranne 6,
D-7400 Tübingen 1, Federal Republic of Germany

Report:
Der Einfluß von Textverständlichkeit und Orientierungshinweisen auf den Lernerfolg von Funkkollegiaten. DIFF-Forschungsberichte 2 (1979). Tübingen: Deutsches Institut für Fernstudien an der Universität Tübingen

6 - Cognitive processes in summarising instructional texts

- The skill to summarise the main points of a prose passage is fundamental for successful learning with complex study materials. To describe the underlying processes a model is proposed, giving an outline of the encoding and decoding processes occurring between the original text and its reproduction. The model is further differentiated on the basis of the results of an empirical study. There appear to be horizontal (intended inferences, elaborations, re-structuring) as well as vertical (omissions, generalisation/ abstraction, clustering, selection) semantic processes. At the beginning of the learning process horizontal processing dominates; vertical processing comes into focus a little later. It is assumed that selective processing and relative weighting of various text components are due to the activation of text schemata for summaries and reproductions, which may differ from the schema of the text. During processing the divergences of the original text schema are corrected by shifting emphases. Text schemata monitor processing in a flexible way, depending on the task environment. The degree of flexibility varies according to the textual contents. For the experimental conditions under study the use of topic markers as structuring aids did not prove effective for summarising.
The model offers more specific insight into the learning activity when confronted with more complex texts. The development of adequate

diagnostic instruments and exercises should create a basis for more specific training in summarising prose passages.

- Mr. Wolfgang Schnotz, Mr. Steffen-Peter Ballstaedt,
  Professor Heinz Mandl,
  Hauptbereich Forschung, Bei der Fruchtschranne 6,
  D-7400 Tübingen 1, Federal Republic of Germany
  Report:
  Kognitive Prozesse beim Zusammenfassen von Lehrtexten.
  DIFF-Forschungsberichte 8 (1980).
  Tübingen: Deutsches Institut für Fernstudien an der Universität Tübingen

7 - Self-perception and self-evaluation in learning.
Metacognitive components of self-regulation when learning from texts.

- Self-regulated learning in the sense of learning independently of direct external influence or instruction constitutes one of the major academic activities. Hence, the development of self-regulated learning with the greatest possible independence has become one of the major objectives in recent research on learning aids and study programmes.
  The present report aims at a description and critical review of recent theoretical and empirical research on the development of self-regulated learning.
  Starting from a description of the main characteristics of self-regulated learning, the study looks into the work of Dansereau (1978), Dansereau and co-workers (1979a, b), Anderson (1979), Anderson & Armbruster (1980), and Weltner's (1978) study-guide programmes. More recent approaches to behaviour modification, particularly the work of Meichenbaum on self-instruction are further considered. The attempt of Meichenbaum & Asarnow (1980) of synthesizing the theory of behaviour modification with metacognitive approaches, is to be evaluated from the perspective of consistency in the choice of theory. The results of Flavell's and Brown's investigations on 'knowledge about knowledge' and 'executive regulation' are discussed. The results of a pilot study about 'metacognitive' verbal minutes taken by students of distance-study course on their awareness of what they were doing is reported on. Tendencies emerging from these minutes are discussed in the light of the approaches of the previous chapters. Recent developments in the

theory of metacognition (Kluwe 1979, 1980a, b; Kuhl, 1980) are considered. The outline of a future integrative theory of self-regulation of learning is sketched. Practical consequences for the methodological and experimental treatment of self-regulative processes are drawn. Furthermore, practical consequences for the actual application of these considerations to the development of programmes fostering autonomy in elarning are outlined.

- Mr. Peter M. Fischer, Professor Heinz Mandl
Deutsches Institut für Fernstudien an der Universität Tübingen
Bei der Fruchtschranne 6,
D-7400 Tübingen 1, Federal Republic of Germany
Report:
Selbstwahrnehmung und Selbstbewertung beim Lernen. DIFF-Forschungsberichte 10 (1980).
Tübingen: Deutsches Institut für Fernstudien an der Universität Tübingen

8 - Predictability of learning results on the basis of hierarchical text structures

- In the present investigation two of the most common models for analysing text structures, the systems of Kintsch and of Meyer, were applied to a complex instructional text and related to recall data. Both methods postulate that texts have a hierarchical structure leading to the effect that in recall high level information is better retained than low level information (levels effect). The following two issues were investigated:
1. What are the problems in applying these two methods to a complex German study text? 2. Is it possible to detect any significant correlation between the hierarchy level of an element of information and its probability of recall?

With both procedures, considerable difficulties appear in application. In addition to the great amount of effort going into the analysis procedure, a central problem is the fact that the analyst of the text has to fall back on his own processing or comprehension processes. This means that the text structures identified in this way already include implicit assumptions concerning the nature of these processes. For all variants of hierarchies the agreement with the recall data was relatively small, i.e. in their present form these models of hierarchization are little suited for valid predictions of learning or recall performance. These results suggest that models for analysing texts will have to be explicitly related to models of processing taking into consideration the formation of macrostructures, previous knowledge and the objectives of the learner.

- Mr. Steffen-Peter Ballstaedt, Mr. Wolfgang Schnotz,
  Professor Heinz Mandl, DIFF an der Universität Tübingen
  Bei der Fruchtschranne 6,
  D-7400 Tübingen 1, Federal Republic of Germany
  Report:
  Zur Vorhersagbarkeit von Lernergebnisse auf der Basis hierarchischer
  Textstrukturen. DIFF-Forschungsberichte 11 (1980)
  Tübingen: Deutsches Institut für Fernstudien an der Universität Tübingen

9 - Self-diagnosis in learning from texts: Usefulness, applicability and validity of questionnaire data

- To explore practicability, usefulness and validity of questionnaire data on the diagnosis of study effectiveness and study outcomes, a German translation of a Study Skill Questionnaire by Dansereau and co-workers was given to a group of 20 university students of law. Each subject had to answer the questionnaire (ratings) and then to give 'operational definitions' about how he had understood the question. Thus the 'naive' psychology of the subjects was verbalised. After giving an operational definition of the item in question, the subject was asked what guided his answer (averaging over situations of longer range or critical incidents as anchors). Judgement behaviour and internal consistency was also investigated. Finally the subject was asked how useful the question might be for purposes of self-diagnosis and self-regulation; alternative item formulations were sought. The data give answers to two research problems: What guides the self-diagnosis of students as instigated by a questionnaire and what is the relationship to empirical findings on self-monitoring and self-control as apparent from studies on metacognitive behavior? Second, the data seem to favour the further development of self-diagnosis items to provide feedback to students when learning from texts. That aspect is especially important for the improvement and elaboration of texts in distance-education, where usually no immediate feedback is given to the student.

- Professor Heinz Mandl, Dr. P. M. Fischer
  Deutsches Institut für Fernstudien an der Universität Tübingen
  Bei der Fruchtschranne 6
  D-7400 Tübingen 1, Federal Republic of Germany

10 - Metacognitive aspects of learning from texts: Operational and meta-operational aspects of study behaviour, 'metacognitive' knowledge and 'metacognitive' awareness of students.

- This study was performed to investigate the 'psychological reality' of metacognitive components of adult study behaviour, especially strategic monitoring, testing and students' evaluation of their own academic work and subsequent conscious control and regulation of study behaviour. 24 university students (Biology) received two versions of study material about Piaget's and Kohlberg's theory on the development of morals and ethics. The passages, each 8 typewritten pages long, differed in that the A-version was 'normal' text without any didactical modification, while version B contained headlines, order or structure cues and advance organisers in the margin. Study time was not restricted. Directly following the reading subjects in group A1 and B1 were interviewed about their reading and study activities, while subjects in groups A2 and B2 had to recall the text information immediately. So subjects in the delayed recall conditions A1/B1 had the retention interval filled, while the A2/B2 subjects had not. Their interview was conducted after finishing the recall. All subjects then had to answer 10 multiple-choice questions about essential topics of the text. Performance measures (recall and comprehension) and behavioural measures (verbal statements of the subjects and observation data by the experimenters) are intended to clarify the relationship between verbal reports on self-guided study (especially self-diagnosis and self-control) and actual behaviour. Differences between 'good' and 'bad' learners are related on study techniques and study strategies, as well as on 'metacognitive' differences.

- Dr. P. M. Fischer, Professor H. Mandl
Deutsches Institut für Fernstudien an der Universität Tübingen,
Bei der Fruchtschranne 6
D-7400 Tübingen 1, Federal Republic of Germany

11 - Possibilities and limitations of multiple-choice-items

- The author discusses possibilities and short-comings of MC-items on the background of the relevant literature and on the background of his own experiences with this type of examination in the Funkkolleg (a multimedia distance-study system).
  The following topics are studied: (1) Attitudes of teachers and learners to this item type, (2) MC-items and the controversy about objective testing , (3) problems of match resp. mismatch between content of learning and this item type, (4) the influence of MC-examinations on preceding and subsequent learning and teaching, (5) the influence of MC-specific strategies (guessing, testwiseness) on MC-examinations, (6) economic and organisational problems of generation and application of MC-items. Two possible developments are anticipated. The one (more undesirable): MC-items become a "dominant" item type because of their economic advantages. The other: MC-items resp. MC-examination are one type within a broader range of examination types.

- Mr. Helmut Felix Friedrich,
  Deutsches Institut für Fernstudien an der Universität Tübingen,
  Bei der Fruchtschranne 6,
  D-7400 Tübingen 1, Federal Republic of Germany

12 - Evaluation of the Funkkolleg (multi-media) "Literature"

- In a questionnaire study, data relating to the following aspects of the Funkkolleg "Literature" were collected and analysed: (1) Socio-demographic status of the participants, (2) prerequisite variables (content-specific pre-knowledge, participation in former Funkkollegs, formal educational level), (3) evaluative judgements about the written material, the radio broadcasts and the tutorials, (4) study behaviour of the participants (weekly time spent on learning, individual media-mix, and others), (5) drop-out and participation in the examinations.
  The data showed that the Funkkolleg "Literature" was judged as rather difficult: The learners stated that concrete examples were underrepresented in favour of abstract-theoretical considerations.

Only 19.6 % (N = 29 176 = 100 %) of the learners inscribed got the Funkkolleg-certificate by passing the two multiple-choice examinations. This is the second lowest value in the history of the Funkkollegs. The relationships between acquistition of the certificate (as a learning outcome) and various predictor variables were analysed: Input variables (i.e. learning prerequisites, socio-demographic variables) showed no substantial correlation with the criterion. Only the initial intention to acquire the certificate and various variables of the reported study behaviours showed substantial correlations with the criterion. These data support a compensatory learning model: Less favourable learning prerequisites and formal education were compensated by a more thorough study behaviour (more time spent weekly on learning, participation in tutorials and others).

- Mr. Helmut Felix Friedrich, Mr. Peter Kucklick
Deutsches Institut für Fernstudien an der Universität Tübingen
Bei der Fruchtschranne,
D-7400 Tübingen 1, Federal Republic of Germany

13 - Evaluation of the distance-study course "Geschichte" (Funkkolleg) - a study of a randomized number (1 500) participants

The aspects of sociodemographical variables, knowledge background, learning activities, difficulties in studying and their respective effects on success in study were described and analysed. It was shown that differing backgrounds of learning do not necessarily lead to differences in learning success, but to a different learning-process: A lack in domain-specific and formal knowledge is usually compensated by a longer amount of time spent in studying, and a more extensive use of the media supplied. Tutorials as learning aids are used more intensively. Given the same background, students with experience in distance study (this means knowledge in the learning system 'Funkkolleg') meet with fewer learning difficulties than those without this experience. The main problem of learning in this system is not primarily previous knowledge but the availability of time in relation to this knowledge. Drop-outs occur frequently when the time for study gets scarce. These time-problems (caused by job requirements, other duties etc.) can be partially solved and moderated by a presentation suited to the needs of the students (speed of presentation, text length, readability), so that the time available can be used economically.

- Ms. Ingeborg Kurbjuhn
  Deutsches Institut für Fernstudien an der Universität Tübingen,
  Bei der Fruchtschranne 6,
  D-7400 Tübingen 1, Federal Republic of Germany
  Report:
  Begleituntersuchung Funkkolleg "Geschichte".
  Tübingen: Deutsches Institut für Fernstudien a.d. Universität Tübingen (in print)

14 - Evaluation of the distance study course "Musik" (Funkkolleg)

- Two inquiries of a randomized number (1 500) of participants were performed.
  The aspects of sociodemographical variables, knowledge background, learning activities, difficulties in studying and their respective effects on success in study were described and analysed. Effects of a preparatory course "Musikalische Elementarlehre" on learning progress and the success of students with different backgrounds in domain-specific knowledge were discussed.
  The Funkkolleg "Musik" was described as difficult by the students, because specific knowledge was needed although the Funkkolleg was adressed to anyone interested in music. The above-mentioned preparatory course at the start of the Funkkolleg was meant to alleviate differences in previous domain-specific knowledge. This aim was not always reached because the time was short, on the other hand the course was considered a helpful means of rehearsal by students who had (relatively) advanced knowledge.
  The consequences in view of the aqcuisition of certificates were: More certificates were achieved by students with previous knowledge, others because of their own view of their abilities tended to a larger extent not to participate in tests. To catch up on lacking domain-specific knowledge was very difficult in the course of this Funkkolleg. However, the drop-out rate did not rise as a consequence of a low level of previous knowledge.

- Ms. Ingeborg Kurbjuhn
  Deutsches Institut für Fernstudien an der Universität Tübingen
  Bei der Fruchtschranne 6, D-7400 Tübingen 1
- Begleituntersuchung Funkkolleg "Musik" (1981)

15 - Are the different conceptions of "text-comprehensibility" comparable?

Testing the comparability of two comprehensibility concepts.

- The comprehensibility concepts of Groeben (1972) and Langer, Schulz von Thun & Tausch (1974) were studied with respect to their comparability. The emphasis lay on the comparison between (1) the dimensional structure of the implicit comprehensibility constructs, (2) the measuring of comprehensibility and (3) the predictive validity of the concepts with respect to cognitive learning effects. The results of the investigation indicate that the comprehensibility concepts under study do not agree, either with respect to the dimensional structure of their implicit comprehensibility constructs, or in relation to the comprehensibility measures and the prediction of cognitive learning effects. Bearing in mind the current state of the art in cognitive psychological research on prose learning, the suggestion is made to redefine "text-comprehensibility" within the concept of a text-learner-learning situation-interaction.

- Mr. Sigmar-O. Tergan
Deutsches Institut für Fernstudien an der Universität Tübingen
Bei der Fruchtschranne 6
D-7400 Tübingen 1, Federal Republic of Germany

Report:
Ist"Textverständlichkeit" gleich "Textverständlichkeit"?
Überprüfung der Vergleichbarkeit zweier Verständlichkeitskonzepte.
DIFF-Forschungsberichte 7. 1980.
Tübingen: Deutsches Institut für Fernstudien a.d. Universität Tübingen

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Börje Holmberg

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C O N T E N T S PAGE

Introductory notes 1

Studies of student bodies and students' motivation 3

Course planning and study objectives 4

Course development 4

Media 5

Non-contiguous two-way communication/ Face-to-face sessions / Counselling 6

Institutional planning, organisation and administration 8

Distance education in developing countries 8

Research on research 9

Other R & D work 9

Concluding remarks 10

Bibliographical References 11

Introductory notes

The twelfth ICCE world conference in Vancouver in June 1982 was taken to be a suitable point in time for a review of research conducted into the theoretical and practical approaches to and applications of distance education. For the purpose two attempts were made to summarise what had been done in the field, one by Dan Coldeway of Athabasca University (Coldeway 1982a) and one by the present author (Holmberg 1982a). Further, within the framework of an empirical investigation of two-way communication in writing as a constitutive element of distance education John Bååth had contributed a relevant research survey on several distance-education principles (Bååth 1980). A study by Tony Bates on trends in the use of audio-visual media in distance-education systems serves a similar purpose (Bates 1982a).

Coldeway's survey describes what has been written on distance education as falling into five categories:

'- position papers that discuss the phenomenon from the authors' perspective with little attempt to define terms and variables
- descriptions of practice at a particular institution
- papers reporting general research findings using variables that are so broad and loosely defined (e.g., tutoring versus non-tutoring) that replication would be practically impossible
- research studies with precisely defined variables (e.g., a particular approach to tutoring) that could be replicated - although they rarely are
- research that applies to distance learning although not conducted with this application in mind.

The last is potentially the largest category of all ' (Coldeway 1982a, p. 29).

Coldeway also lists some factors limiting the role of research in distance education:

- 'educational researchers are rarely present during the design of distance learning systems
- there is no clear paradigm for research in distance learning and it is difficult to attract funds to develop one
- there have been no consumer groups or publication outlets for such research (although this is changing)
- some institutions are averse to defining boundaries and variables clearly since practitioners work with macro-level variables (e.g., tutoring) and fear that breaking them down into components will complicate the phenomenon
- educational researchers often ask questions of no practical, or even theoretical relevance. The tendency to ask "What happens when you try this?" diverts them from the more important issue of "How do you make this happen" (Geis, 1980)
- researchers in distance learning test variables that are really classes of variables (e.g., comparisons of distance and classroom learning). The results are impossible to replicate and of dubious utility anyway.

Although educational research may and should contribute significantly to distance learning as it matures and expands across institutions, these problems hinder any review of the literature (Coldeway 1982a, p. 30).

After referring to some previous reviews of distance-learning research Coldeway directs his attention to 'some more recent research in the light of a two-year project conducted at Athabasca University called REDEAL (Research and Evaluation of Distance Education for the Adult Learner)' (ibid.). There can be no doubt that this research project as well as Coldeway's comments deserve careful attention.

My pre-conference review is more comprehensive and includes references to some of the work discussed by Bååth and Coldeway. It was written at the end of 1981 and was partly based on a questionnaire study. It is by no means complete. Unfortunately it leaves some important areas insufficiently covered, for which not only human frailty is to be blamed but also the passing of time. Some new findings had come to light by June 1982, when the ICCE world conference took place.

The following is meant to be a supplement to this previous report entitled 'Recent Research into Distance Education'. There I divided the material into fifteen sections. Below I supplement ten of these sections by mentioning additional research within the subject areas concerned. They are sections 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.13 and 1.15, i.e. studies of student bodies, course planning and study objectives, course development, media, non-contiguous two-way communication, face-to-face sessions, counselling, institutional planning, distance education in developing countries and research on research. Many studies included in the ICCE conference book 'Learning at a Distance' (Daniel, Stroud & Thompson 1982) are relevant in this context.

Studies of student bodies and students' motivation

Contributions to our knowledge of distant students, their study and general conditions are provided in 'Learning at a Distance' by Knapper & Wasylycia-Coe (41)[1], Morgan, Taylor & Gibbs (32), Waniewicz (28) and others. Among earlier studies should be mentioned Abels, Heinze, Horstkemper & Klusemann 1977, which is a study on qualitative content analysis introducing face-to-face interview methods with a view to coming to grips with relevant aspects of the life and conditions of distant students. Graham Wagner 1981 also appears relevant.

New completion and drop-out studies apart from those mentioned in my previous research review are reported on in 'Learning at a Distance' (papers by Rekkedal /38/, Shale /36/, Woodley /37/ and others).

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[1] Figures in brackets denote paper numbers in the conference book.

Course planning and study objectives

Two interesting studies of Australian origin contribute to our knowledge in the areas of course planning and catering to study objectives. Inglis 1981 has analysed the feasibility of teaching manipulative skills by distance-study methods and in this investigation draws a line of distinction between intellectual and motor aspects of learning a manipulative skill. The second study, Stafford 1981, is concerned with applying cognitive-style mapping (in the spirit of Hill 1971) to distance education with a view to paying attention to individual differences among learners. In this context it seems logical to refer to a study of affective education at a distance in the conference book by Marchand (94). Apart from Inglis and Marchand there seem to be few investigations of either psychomotor or affective study objectives in distance education. For psychomotor objectives cf. Granholm 1971a, however.

Course development

Marton's mapping out of deep learning and surface learning briefly referred to in my earlier research review (p. 26) is supplemented and explained on a theoretical basis in two different conference papers, those by Marton & Svensson (31) and Morgan, Taylor & Gibbs (32). This approach has bearings on the development of instructional texts and on what, if anything, can be done to promote study skills. On the latter concern also see the conference papers by Forsythe (81) and Howell (83). Of particular relevance to distance educators are the possible rejection of 'all-purpose study technique courses' (Marton & Svensson 1982, p. 101) and wariness in relation to text manipulation by means of attention directors. Cf. Weingartz 1981.

For course development in writing Holmes' conference paper (35) on readability of study materials is relevant and interesting to distance educators, particularly because of its application of the so-called cloze procedure. Penney's conference paper (34) is another contribution to the study of course design, in which reference is made to 'content analysis' in a way distinctly different from conventional quantitative content analysis (Berelson 1971), undoubtedly a useful research technique also for distance education. Recent German studies of relevance are Schnotz 1982 on the influence of text organisation on learning (with the verdict that no specific text organisation is generally superior but that the text content and the target group is decisive in each case) and Hron 1982 on the evaluation of course units.

The 1981 ASPESA Forum in Fiji included a study of the readability assessing of distance-learning materials by Marianne Tremaine and an investigation of adult students' needs in relation to course content and design by Graham Wagner, both available in one of the ASPESA volumes of papers (see bibliography). A fairly comprehensive German survey of the problems related to the structure and presentation of distance-study courses is provided in Holmberg 1982b.

Media

The much too meagre presentation of progress in the use of various media and media combinations made in section 1.5 of my previous ICCE review of research (p. 30) should first of all be supplemented by a reference to the many informative contributions to the conference book under the heading 'The contribution of media and technology to learning at a distance' (D'Antoni /109/, Bååth /118/, Barnes /106/, Boyd /100/, Cowper & Thompson /117/, Dichanz /102/, Ellis & Chapman /105/, Friedman /112/, Hurly & Hlynka /110/, Kaye /107/, Lampikoski /113/, Lefranc /104/, Lewis /116/, McConnell /115/, Madden /101/, Phillips & Young /114/, Ruggles & Blackmore /111/, Schimeck /103/ and Waniewicz /108/.

Some of these are concerned not only with media for the presentation of subject matter but also for non-contiguous two-way communication as discussed in my previous research review in section 1.6, thus, e.g. Bååth, Boyd, Lampikoski and McConnell.

ASPESA studies of communication via satellite and audio-visual media (Atkinson, Mainwaring & Jennings; Griffin; Gwynn; Haynes, Symes & Chipley; Hurley; Livingston & Apted and Potter, all 1981) further illustrate new developments in this area.

Other important research contributions are, for instance, four papers by Bates duplicated at the Institute of Educational Technology of the Open University (1981, 1982) which look into the use of educational media, among them radio, television and microprocessor technology. Brown 1981 on roles for instructional television should also be mentioned here.

The use of media for distance education has been analysed by Hlynka & Hurly with a view to unraveling misconceptions and identifying analytical paradigms developed to facilitate effective media utilisation.

Among more general treatments of instructional media of interest to distance educators should be mentioned Salomon 1979 and Schramm 1977.

Non-contiguous tutorial two-way communication / Face-to-face sessions / Counselling

The three areas listed were dealt with in my previous research review in sections 1.6, 1.7 and 1.8. Here I limit myself to referring to some new titles concerned with these areas, many of them printed in the conference book under the heading 'Student support and regional services' (Caron /51/, Cochran & Meech /50/, Freeman /57/, Fritsch /48/, Kirkinen /52/, R. Lewis /46/, Meaking /55/, Mills & Tait /53/, Salter /54/, Singer /49/, Smith & Small /47/ and Walker /56/). A useful study printed elsewhere is Gillard 1981, in which a continuum model is sketched showing the range of possible distance in the relationship between teacher and learner. Gwynn 1981 and Owen 1981 investigate, from different viewpoints, student-student contact.

An interesting overview of 'student use and appreciation of tuition' in the Open University is presented in Kelly 1982 (year?). Among other things Kelly reports that one student in ten of his population appears not to have made use of correspondence tuition and that the telephone was found less helpful than other forms of tuition.

Apart from the ICCE conference papers already mentioned also others are concerned with tutorial and counselling communication. Thus Sewart (5) does so in an analysis of what distance-study institutions can do and have done (notably the Open University) to support their students, and the same applies to Finkel (30) in a plea for tutor-initiated contact. Rekkedal 1981 introduces a new comprehensive research project based on the tutor/counsellor concept but integrating a number of variables having ' a positive effect on study activity and completion rates' (op.cit. p. 32), such as extremely short turn-round time for students' assignments, use of telephone tutoring and tutors' personal follow-up activities. There is every reason to expect interesting outcomes of this research project profitable for distance educators everywhere. The project follows on a series of valuable studies by Rekkedal (1972, 1973a and b, 1976 and 1978) which have exerted great influence on present theoretical and practical approaches.

A Kenyan study by Gitau (10) indicates that too much face-to-face contact may be harmful as it encroaches on the independent learning of students. This, interestingly enough, parallels an experience made in a highly industrialised part of the world, viz. Sweden (Holmberg 1977). According to an oral report by R. M. Delling an East-German study, not available to the public or scholarly community, refers to identical findings.

Finally in this context I wish to refer to Granholm 1971b, which is a secondary analysis of various studies on the efficiency of distance study in relation to face-to-face teaching, supporting Childs' statement that distance education is not inferior to conventional teaching.

I apologize for having included the wrong Granholm reference in my previous research review (pp. 35 and 66). The correct one is the title identical with Granholm 1971b in the bibliography at the end of this supplementary research review.

Institutional planning, organisation and administration

An evaluation of the innovative experience of the Open University of considerable interest to all distance educators had only just been published at the time of the ICCE conference (Rumble 1982). Under the heading 'Policy-making and management' in the conference book several new contributions were made, mainly in the form of case studies. Papers on principles of more general applicability to be mentioned are those by Potter (66), Rumble (72) and Shobe (71) on a comparative model for distance studies, on economic models and on systems approaches. Case studies of interest occur also in the PAPERS of the 1981 ASPESE Forum (Crump & Livingston 1981).

The Keller-plan approach, 'Personalised System of Instruction'(PSI), has been studied further from the point of view of distance education. Cf. my previous review of research p. 40. Stanford 1981, confirming that PSI is readily applicable to distance education, is highly relevant in this context. Cf. Coldeway's papers in 'Learning at a Distance' (6, 29).

The library in distance education has so far been given scant attention in spite of the evident importance of the subject. A recent collection of conference papers from Townville College of Advanced Education in Australia contributes to filling the gap (Store 1980).

Distance education in developing countries

The conference book 'Learning at a Distance' contains new papers considering the problems of distance education in developing countries (Anderson /18/, Ansere /12/, Datt /14/, Gupta /15/, Trillo /17/). A new independent study, not yet published when my previous research review was prepared, is Hakemulder 1982. Articles on the subject not mentioned previously are, for instance, Hurley 1981, Kember 1981 and Maxwell-Mahon 1981.

Research on research

The evidently profitable approaches of Ference Marton and his group of scholars mentioned above under Course development and in my previous research review have a philosophical background which, in a way at least partly relevant to the presentation referred to, has been developed in a new paper on Marton's epistemological thinking and 'phenomenography' concept (Marton 1981).

Under the heading 'Research on research' it may also be in order to include Holmberg 1982c on the aims and methods of educational research, for which the concerns of distance education constituted a background.

Other R & D work

The ICCE world conference in 1982 bears witness to widely spread, lively and vigorous activities in distance education, which is now a truly international concern. These activities are evidently more and more being accompanied by research into the potentials, conditions, methods and results of distance education. The ICCE conference book of 1982, 'Learning at a Distance'(with its excellent author and subject indices), the ICCE Newsletter, the journals 'Distance Education', 'Epistolodidaktika', 'Teaching at a Distance' and 'Off Campus', the Deakin occasional papers, all provide documentary evidence of this, as do also individual conference and workshop reports of the professional bodies in the field.

Concluding remarks

The above supplement to my research review published in February 1982 has, for practical reasons, been limited to the research areas reported on in my previous review. Any reader of the publications referred to in the previous paragraph will be aware that much more has been done both of an evident research character and in the form of tentative approaches and case studies well worth looking into. A miscellany entitled 'Diverse subjects, diverse approaches' in the conference book indicates the variety of problems being considered by distance educators at present. The importance of studying the application of distance education to special disciplines, stages and target groups appears to be great (cf. Abrioux /86/, Horlock /95/, Innes /88/, Loudon /93/, R.C. Smith /96/, for instance). On post-graduate distance study, referred to in the conference book in a paper regrettably marred by ommissions in the text and illogical editing, a separate study occurred prior to the ICCE conference (Holmberg 1981).

The selection of what to include in research reviews must necessarily be idiosyncratic, and inevitably any review of this kind is to some extent obsolete already on publication as, fortunately, research is an on-going process. Nevertheless I hope that this supplement together with my original research review will be useful. Maybe the two can provoke someone to produce a better selection and a more comprehensive survey filling the gaps left by my work?

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